

**The Supply Chain of Relief Materials:**  
**A guideline for container ports in Sub-Saharan Africa**

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## DECLARATION

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O.A Osundiran

## **DEDICATION**

This work is dedicated to the Lord Almighty in whom all things are possible. I can do all things through Christ that strengthens me.

To my husband, Olumayowa Osundiran, and to our children and disciples, Daniel, Temiloluwa, Phumzile, Ohuninioluwa, Ayanfeoluwa, Obajuwonlo and Obademiladeogo. Thank you for your sacrifices and for believing in me.

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Port of Cape Town

Port of Durban

Port of Dar es Salaam

Port of Mombasa

Port of Tema

Tema Maranatha

All the respondents from the Humanitarian Organisations:

Mr Terry Jeggle of CARE

CARE

IKRA Educational Training Centre-IETC

International Federation of Red Cross and Red Crescent Societies

United Nations High Commissioner for Refugees

United Nations World Food Program

World Vision International

All the respondents from the Shipping Company

Mediterranean Shipping Company (MSC)

Maersk Line

CSAV

DAMCO Logistics

Mitsui O S K Lines

UTi

My mother-in-law Titilayo Kehinde Osundiran

My mother Mrs Remi Adeyemo

My husband, Olumayowa, thank you for paying the price with me.

My Disciples Bro Lanre and Sister Kikelomo Adeboye for standing in the gap.

## ABSTRACT

In a world of growing crisis, both natural and political, the operation of humanitarian organisations, which provide relief to critically affected communities, have become increasingly significant. With the increased relevance of disaster relief and development programs on a global scale, more and more research is being conducted to improve the efficiency of humanitarian logistics around the world.

Disasters can wipe out decades of progress and development in just a few seconds. The impact in terms of both death and economic losses is increasing substantially. In 2008, for Sub-Saharan Africa, the death toll from natural disasters trebled to 235 000 from an annual average of 66 000 over the period of 2000–2007.

The increase in the spate of disasters in Sub-Saharan Africa continues to generate interest particularly in the supply chain of relief materials to the victims of disasters. However, little work has been done on humanitarian logistics in developing countries. This identifies the importance of conducting research on supply chain management specifically for the handling of relief materials in developing countries.

Ports have a role to play in the supply chain of relief materials. Maritime transport is the most cost-effective mode of transporting the relief materials from the port of origin to the port of destination. Once the goods arrive at the local port of entry, there is a need for the goods to be cleared at the port of destination with as little effort as possible. Therefore, this thesis looks at ways of reducing the cargo dwell time at the ports, especially for relief cargoes that require expedition.

The importance of this research lies in the development of a framework and guideline for the handling of disaster relief materials in Sub-Saharan African ports. This framework and guideline, if adopted, will help streamline the supply chain of relief materials, thereby saving costs for all the maritime stakeholders including shipping lines whose vessels will spend less time in ports. The guideline will streamline the processes and reduce cargo dwell time. It will also provide a forum for improving supply chain management through collaboration.

**Keywords:**

*Cargo dwell time; Container ports; Guideline; Humanitarian logistics; Relief materials; Sub-Saharan Africa*

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## LIST OF ACRONYMS

AAH	Action Against Hunger
ADR	African Development Report
ANF	Arrival Notification Form
AU	African Union
CARE	Cooperative for Assistance and Relief Everywhere
CDERA	Caribbean Disaster Emergency Response Agency
CEPREDENAC	The Centre for the Prevention of Natural Disasters in Central America
CRED	Centre for Research on the Epidemiology of Disasters
ECHO	The European Community Humanitarian Office
EDI	Electronic Data Interchange
EM-DAT	Emergency Events Database
ENSO	El Nino-Southern Oscillation
FAO	Food and Agriculture Organisation
GFDRR	Global Facility for Disaster Reduction and Recovery
HUMLOG	Humanitarian Logistics
ICSU	International Council of Scientific Unions
IETC	IKRA Education Training Centre
IFRC	International Federation of Red Cross and Red Crescent Societies
MSC	Mediterranean Shipping Company
NGO	Non-Governmental Organisation
OCHA	Organisation for the Coordination of Humanitarian Affairs
PAHO	Pan American Health Organisation
PMAESA	Port Management Association of Eastern and Southern Africa

RTG	Rubber Tyred Gantry
SAPICS	South African Production and Inventory Control Society
SARS	South African Revenue Services
SASDiR	Southern Africa Society for Disaster Reduction
SOP	Standard Operating Procedure
STS	Ship to Shore Gantry
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDAC	United Nations Disaster Assessment and Coordination
UNDMT	United Nations Disaster Management Team
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNHRD	United Nations Humanitarian Response Depot
UNICEF	United Nations Children Economic Fund
UNSDR	United Nations International Strategy for Disaster Reduction
UNWFP	United Nations World Food Programme
VOICE	Voluntary Organisations in Cooperation in Emergencies
WHO	World Health Organisation
WPS	World Port Services
WVI	World Vision International

## CHAPTER 1: INTRODUCTION

### 1. Introduction and Background to the study

In a world of growing crisis, both natural and political, the operation of humanitarian organisations, which provide relief to critically affected communities, have become increasingly significant (Branczik, 2004). With the increased relevance of disaster relief and development programs on a global scale, more and more research is being conducted to improve the efficiency of humanitarian logistics around the world (Barcock, 2015).

The increase in the spate of disasters in Sub-Saharan Africa continues to generate interest particularly in the supply chain of relief materials to the victims of disasters (Tomasini and Van Wassenhove, 2009b). However, Olorunfoba and Gary (2002) aver that little work has been done on humanitarian logistics in developing countries. This identifies the importance of conducting research on supply chain management, specifically for the handling of relief materials in developing countries.

Kovacs and Spens (2009) confirmed that the field of humanitarian logistics is in need of both conceptual and empirical studies in order to improve the field. They also emphasised the fact that the majority of research conducted in the field of humanitarian logistics focuses on Asia. This identified the need for this research that focuses on Sub-Saharan Africa.

Humanitarian logistics is defined as “the process of planning, implementing and controlling the efficient, cost effective flow and storage of goods and materials as well as related information from the point of origin to the point of consumption for the purpose of meeting the end beneficiaries’ requirement” (Thomas and Mizushima, 2005). It encompasses a range of activities that includes procurement; transport; tracking and tracing; customs clearance, local transport, warehousing and end haul delivery (Thomas, 2003).

Figure 1.1 shows the humanitarian logistics process. The process starts when the non-governmental organisations order humanitarian commodities on behalf of a country that has just experienced a natural disaster. The goods are transported by road to a warehouse where they are consolidated to fit into containers. The containers are then shipped to the port of the country that is affected by the natural disaster. At the port, the customs fees and port fees are paid and the goods are cleared. The goods are then loaded into trucks, after which they taken to another warehouse for the relief materials to be unpacked, sorted and distributed.



**Figure 1.1: The humanitarian logistics process**

Source: The American Relief Team, ART (2008)

Furthermore, Van Wassenhove (2006) states that, “Since disaster relief is about 80% logistics it would follow then that the only way to achieve this is through slick, efficient and effective logistics operations and more precisely, supply chain management.” The India Tsunami of 2004 proved the importance of applying supply chain management to a disaster situation (Pettit et al., 2011). Cozzolino, Rossi & Conforti (2012) state that supply chain management of relief materials focuses on the relationships and integration amongst all the stakeholders in the maritime supply chain.

This study focuses on the relationship between the maritime stakeholders in selected Sub-Saharan African ports and provides solutions to the problems that affect the seamless flow of the supply chain of relief materials. This research is critical to Africa, because ten of the world’s 20 most disaster-prone countries are in Africa (World Bank, 2009b). The 20 most highly ranked disaster prone countries are shown in Table 1.1. Disasters can wipe out decades of progress and development in just a few seconds. Their impact, in terms of both death and economic losses, is increasing dramatically (World Bank, 2009b). In 2008, the death toll from natural disasters trebled to 235 000 from an annual average of 66 000 over the period of 2000–2007 (World Bank, 2009b). Climatic change is expected to magnify the frequency and impact of extreme weather events. Poor countries are the most severely



affected owing to their intrinsic vulnerability to hazards and comparatively low capacity for risk reduction measures (UN, 2009).

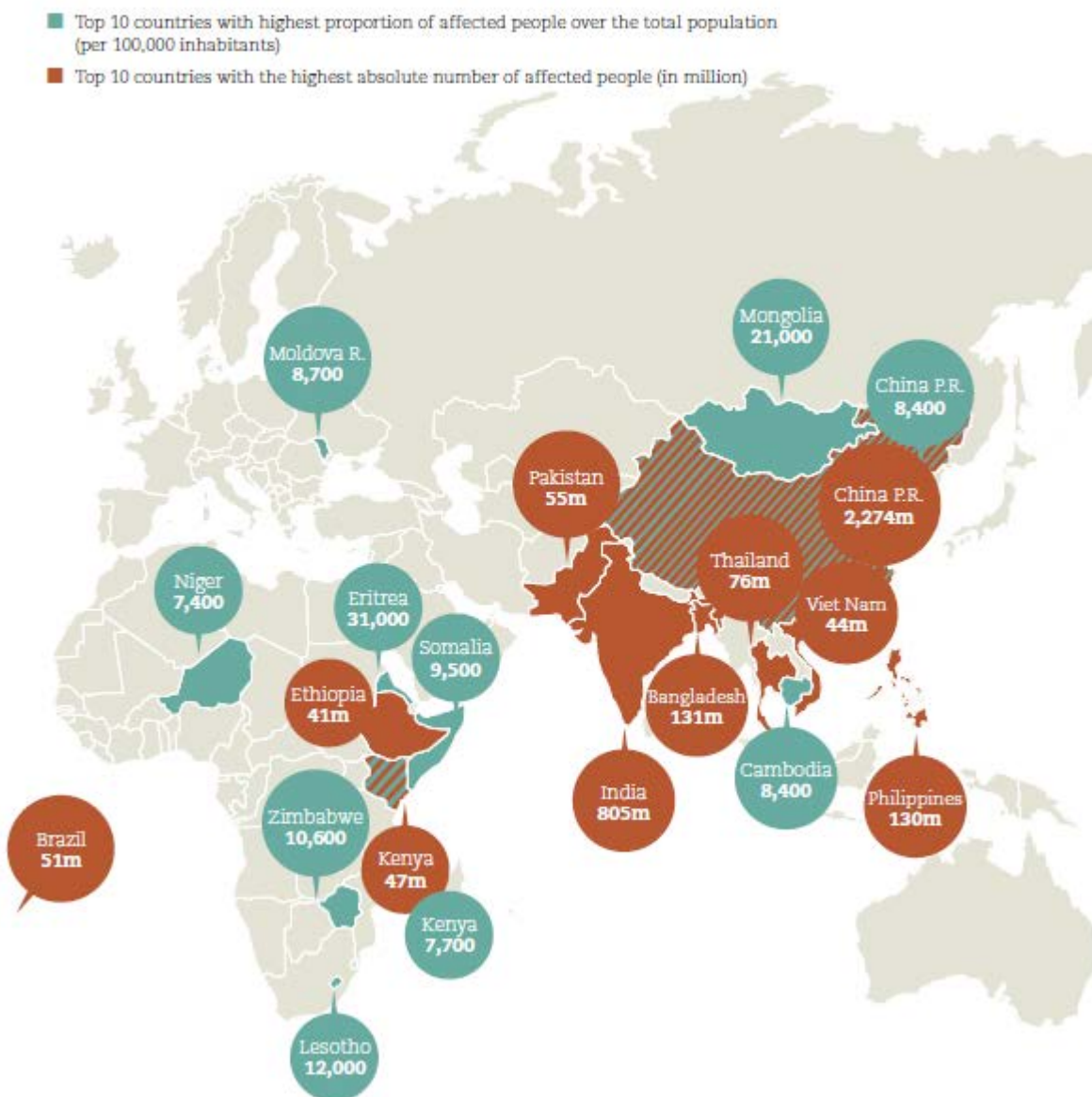
**Table 1.1 List of the 20 most highly ranked disaster-prone countries in the world in 2009**

S/N	COUNTRY	S/N	COUNTRY
1	<b><u>Burkina Faso</u></b>	11	Marshall Islands
2	<b><u>Djibouti</u></b>	12	<b><u>Mozambique</u></b>
3	<b><u>Ethiopia</u></b>	13	Nepal
4	<b><u>Ghana</u></b>	14	Panama
5	Haiti	15	Papua New Guinea
6	Indonesia	16	<b><u>Senegal</u></b>
7	Kyrgyz Republic	17	Solomon Islands
8	<b><u>Madagascar</u></b>	18	<b><u>Togo</u></b>
9	<b><u>Malawi</u></b>	19	Vietnam
10	<b><u>Mali</u></b>	20	Yemen

Source: World Bank, 2009

Table 1.1 shows that 50% of these countries are located in Africa. This is identified in bold and underlined in Table 1.1.

Between 1995 and 2015, EM-DAT recorded 6,457 weather related disasters that claimed a total of 606,000 lives and affected more than 4 billion people in the world. On average, 205 million were affected by such disasters each year (CRED, 2015). Figure 1.2 shows the top ten countries (by total population) affected by weather related disasters between 1995-2015. Figure 1.2 highlights seven countries situated on the African continent.



**Figure 1.2 Countries by Population affected by weather-related disasters 1995-2015**

Source: The Human Cost of Weather- Related Disasters 1995-2015 CRED 2015

The importance of this research lies in the development of a guideline that will outline the processes in the maritime supply chain for selected ports and reduce cargo dwell time through the use of appropriate documentation.

### 1.1 Problem Statement

In an interview conducted with Terry Jeggle, the representative of CARE, it was mentioned that one of the problems they experience in sending shipments into ports in Sub-Saharan Africa is the lack of understanding of the documentation requirements needed for clearing relief shipments. This then

contributes to long dwell times of the cargo at the port of destination (Field work, 2012). Paperwork may seem like a simple issue in this era of information technology, but there are still communication channel challenges. This is because much larger documents are involved in global transactions. Therefore, the country of export, country of import; transportation companies, banks and importers all require varying documents (Coyle et al., 2011). Freight documentation control the cargo on its journey from origin point in the country of export to its final destination in the country of import (Coyle et al, 2011:71). Missing or incorrect paper work can cause delays and additional costs. A failure to provide complete cargo information 24 hours prior to loading at an international seaport can lead to denial of loading, fines and penalties. Paperwork errors can lead to custom clearance delays, additional inspection and improper application of duty rates. Hence, proper and accurate documentation is critical to the timely and cost efficient flow of international cargo (Coyle, et al, 2011:71). The logistics costs involved in any humanitarian operation have been estimated to lie in the region of 80-90% of the total expenditure of a humanitarian organisation (Van Wassenhove, 2006). Transportation is the second highest cost of any humanitarian operation and, therefore the highest logistics cost (Martinez et al., 2010). Prolonged delays at the port have further contributed to this cost (Notteboom, 2006). Lack of exemption from customs and other difficulties in customs procedures translates to lack of preparedness in the country (Kovacs and Spens, 2009).

## **1.2 Research Questions**

The following are the research questions that are answered in this thesis:

RQ1: What constitutes the processes involved in the supply chain of relief materials into Sub-Saharan Africa?

RQ2: What are the critical issues that affect the dwell time of relief shipments?

RQ3: How can the cargo dwell time of containers that are laden with relief materials be reduced?

RQ4: What role does the guideline perform in order to reduce cargo dwell time, if any?

## **1.3 Research Objectives**

The Objectives of the research are to:

- Examine the flow of humanitarian relief materials through the maritime supply chain via selected Sub-Saharan Ports.
- Examine the problems that various stakeholders such as freight forwarders, humanitarian organisations and the ports experience during the process.
- Determine how these problems affect the cargo dwell time at the selected Sub-Saharan Ports?

- Develop a guideline that the stakeholders can use to reduce the dwell time of containers loaded with relief materials in container terminals in ports.
- Indicate through a process flow, the role of each maritime stakeholder along a maritime supply chain for relief materials.

#### 1.4 Scope of study

This study covers container ports in Sub-Saharan Africa only. The reason for this is that the majority of relief materials are shipped in containers, even though relief materials can also be shipped in bulk (Transnet, 2014). Focus is placed on selected container ports in West Africa, East Africa and Southern Africa. The ports examined are depicted in Table 1.2.

The study also focuses on selected container shipping lines and freight forwarding companies that have wide coverage in Sub-Saharan Africa. These are:

- Mediterranean Shipping Company (MSC)
- Maersk Line
- CSAV
- DAMCO Logistics
- Mitsui O S K Lines
- UTi.
- SDV-Bollore-Bollore

In addition, the study focuses on selected humanitarian organisations that have a wide coverage in Sub-Saharan Africa. These are:

- CARE
- IKRA Educational Training Centre-IETC
- International Federation of Red Cross and Red Crescent Societies
- United Nations High Commissioner for Refugees
- United Nations World Food Programme
- World Vision International

**Table 1.2: Selected container ports in Sub-Saharan Africa**

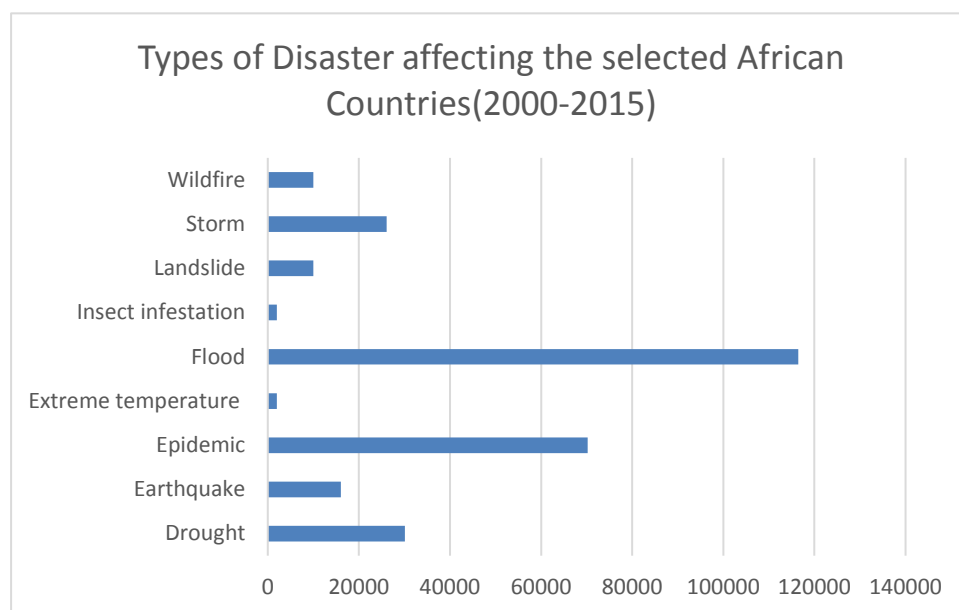
REGION	COUNTRY	CONTAINER TERMINALS
East Africa	Kenya	Port of Mombasa Container Terminal
	Tanzania	Tanzania International Container Terminal (TICT),

<b>West Africa</b>	Ghana	Port of Tema Container Terminal
	Ghana	Tema Maranatha Terminal
<b>Southern Africa</b>	South Africa	Port of Durban Container Terminal Port of Cape Town Container Terminal
	Namibia	Port of Walvis Bay Container Terminal

Source: World Port Source, (WPS, 2011)

### 1.5 Motivation of the study

The researcher worked in one of the ports in West Africa for eight years. During her time at the port, she observed prolonged delays at ports. This prompted the need to find solutions to reduce cargo dwell time at ports. The fact that relief materials are urgent shipments also made this study pertinent. The reason for selecting Kenya, South Africa, Tanzania, Namibia, and Ghana, is because of access to data from ports in Sub-Saharan Africa. These countries have all experienced one form of disaster or another. Figure 1.3 is a bar chart generated from the EM-DAT database. It shows the type of disasters affecting the selected African countries from 2000-2015.



**Figure 1.3 Types of Disaster affecting the selected African Countries**

Source: (CRED, 2015)

### 1.6 Layout of Contents

This section gives a chapter by chapter description.

- **Chapter Two: Methodology**

This chapter encapsulates the research methodology and design. It focuses on the tools used to obtain data and information from the field.

- **Chapter Three: Literature Review**

This chapter gives a review of literature, specifically on key areas such as humanitarian logistics, supply chains, and natural disasters. It also focuses on the maritime stakeholders that are involved in the supply chain at a global level.

- **Chapter Four: Literature Review Specific to Africa**

This chapter gives a review of literature, focusing specifically on Africa. It examines selected ports in Africa; focusing on issues such as port infrastructure, problems, proactive measures, efficiency indicators and the implication of delays at the ports on relief materials.

- **Chapter Five: Results of Research**

This chapter focuses on the results of data obtained from the field. It examines the various stakeholders and their responses.

- **Chapter Six: Generic Guideline to handling relief materials**

This chapter shows the purpose and possible outcome of a generic guideline. It further, examines the responsibilities of each stakeholder in the supply chain. A flow diagram was constructed to show the flow of information for each maritime stakeholder.

- **Chapter Seven: Specific Guideline for the Port of Durban Container Terminal**

A specific guideline was developed and tested for the Port of Durban Container Terminal.

- **Chapter Eight: Conclusion**

This chapter concludes the thesis and provides recommendations.

## **CHAPTER 2: METHODOLOGY**

### **2.1 Introduction**

This chapter gives an overview of the research design and methodology used in this thesis. It looks at the research methodology and the practical approach used to achieve the set of research objectives. The research of this study was done in four phases. The first section focuses on the secondary research. The second section focuses on the primary research. This includes the process of data collection. The third section focuses on the analysis done based on the guideline developed. Finally, the techniques used for the data analysis and the limitations of the study are examined.

### **2.1 Secondary Research**

Chapters three and four focus on the secondary research. Chapter three, which is the initial literature review, focuses mainly on key concepts and issues to give a better understanding of the subject matter. Chapter four, which is the second literature review chapter, examines the Sub-Saharan African ports and container terminals, focusing on the various problems and challenges peculiar to these ports. Various efficiency indicators are also examined to help ensure that the cargo dwell time of containers is reduced with the aid of guideline. In addition, Chapter four also shows what documents are required at the selected Sub-Saharan African ports.

### **2.2 Primary Research**

Chapter five explores cases that involve humanitarian organisations, shipping lines and freight forwarding companies as well as container terminals and ports. A case study approach was used, because the research is attempting to answer the question, how best can a port reduce the cargo dwell time of containers that are laden with relief materials?

The data was collected using qualitative research methods namely; semi-structured, interviews; telephonic interviews and questionnaires (electronic and hard copy). The chapter ends with a discussion related to validity, reliability and triangulation.

A holistic approach of inquiry was used; involving the use of multiple methods of data collection for examining the maritime stakeholders and the problems affecting the supply chain of relief materials.

### **2.3 Research approach and research strategy**

This research focused on the port, shipping lines and freight forwarding companies and humanitarian organisations. The following data collection methods were used:

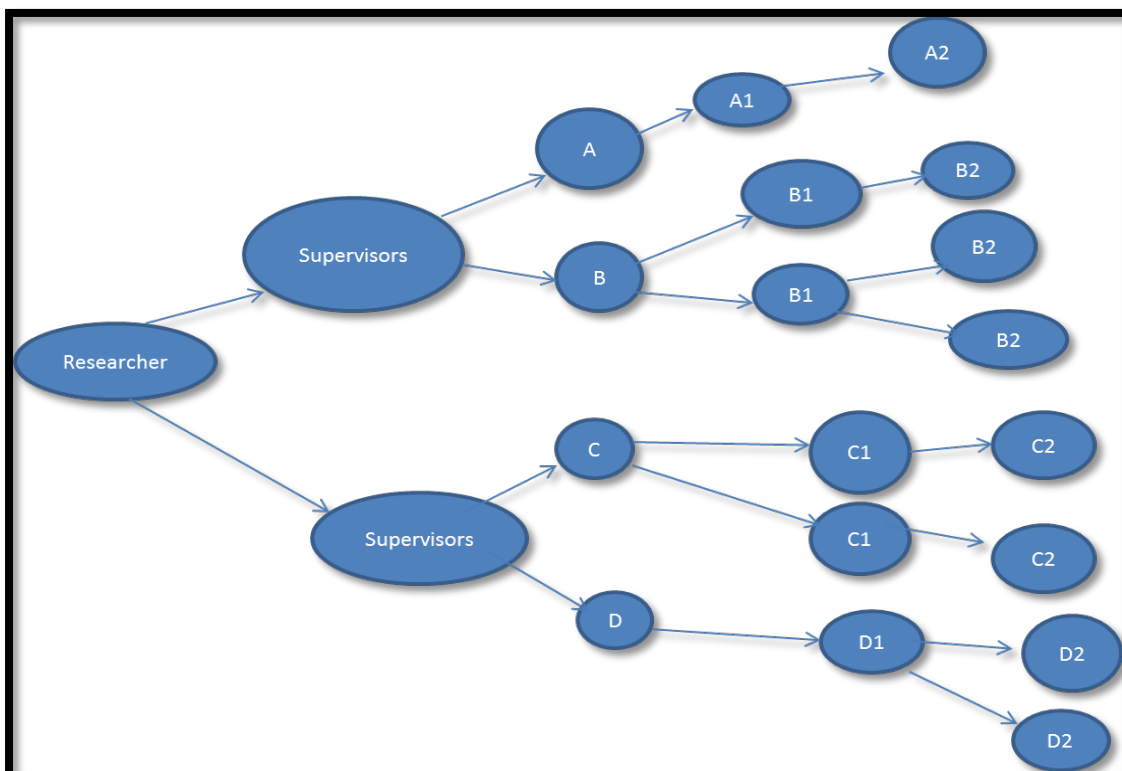
- Sampling

- Interviews
- Questionnaire
- Electronic survey

### 2.3.1 Sampling

There are two types of sampling methods used in this research. They are the purposive and snowball sampling. Due to the sensitive nature of ports, particularly with regards to divulging information, it was necessary to rely on people that already have a relationship with the Port Authority. Therefore, purposive and referral sampling was used in the selection of the unit of analysis.

The snowball approach consists of a network of contacts that are linked to other contacts. The questionnaire was administered to some of the respondents that were met at the following conferences: The South African Society for Disaster Reduction (SASDiR) (2012), South African Production and Inventory Control Society (SAPICS) (2012), African Ports and Harbours Show 2013 and African Ports and Harbours Show 2014. Figure 2.1 shows how the network of contacts was developed or ‘snowballed’. The initial contacts were provided by the study’s supervisor. A, A1, A2, B, B1, B2, C, C1, C2 and D, D1 and D2 are symbols that denotes the contacts.



**Figure 2.1 Snowball approach**

Source: Author, July 2013



## Unit of Analysis: Samples

This research is qualitative in nature and leans towards an inductive methodology. In this research, there are three sets of units of analysis, namely:

1. Selected container terminals in ports in Sub-Saharan Africa. They are:
  - Container terminal in the Port of Mombasa in Kenya
  - Container terminal in the Port of Dar es Salaam in Tanzania
  - Container terminal in the Port of Cape Town in South Africa
  - Container terminal in the Port of Durban in South Africa
  - Container terminal in the Port of Walvis Bay in Namibia
  - Container terminal in the Port of Tema in Ghana
  - Tema Maranatha container terminal
2. Selected humanitarian organisations
  - CARE
  - IKRA Educational Training Centre - IETC
  - International Federation of Red Cross and Red Crescent Societies
  - United Nations High Commission for Refugees
  - United Nations World Food Programme
  - World Vision International
3. Selected container shipping lines and freight forwarding companies
  - Mediterranean Shipping Company (MSC)
  - Maersk Line
  - CSAV
  - DAMCO Logistics
  - Mitsui OSK Lines
  - UTi.
  - SDV-Bolllore

## Reasons for selecting the ports

- Seven container ports of entry were selected from Southern, East and West Africa. The Container ports were chosen, because they were points of entry for relief materials to regions experiencing natural disaster or conflict at the onset of the research.

Reasons for selecting the shipping lines and freight forwarding companies

The criteria for selecting the shipping lines and freight forwarding companies were the following:

- Coverage: They do business with Africa. Most of the shipping lines and freight forwarding companies have offices in some, if not most, of the 54 nations in Africa.
- Experience: The shipping lines and freight forwarding companies have years of experience in handling relief materials in containers.
- Exposure: These shipping lines and freight forwarding companies have been exposed to the peculiarities of Africa, for example, infrastructural problems in West Africa.

Reasons for selecting the humanitarian organisations

- Coverage: Most of the humanitarian organisations have offices in at least half of the 54 nations in Africa.
- Experience: Sending relief materials to regions in Africa is not alien to these humanitarian organisations. They know and understand the needs.
- Exposure: These humanitarian organisations have been exposed to incidences of natural disasters and conflict.

### **2.3.2 Interviews**

For the purpose of this research the following are the types of interviews that were used:

- Physical on-site interviews: Travelling to the where the respondent was located.
- Telephone based interviews: Telephonic interviews proved more effective, because of financial reasons and geographical constraints. Follow-up calls were made two weeks after the first call. This yielded more results.

Semi structured interviews: The physical on-site interviews and telephone based interviews were semi-structured in nature. The interviews were conducted on the following entities: unit of analyses.

The interviews were:

- Port of Cape Town
- Mediterranean Shipping Company
- CARE

### **2.3.3 Questionnaire**

A questionnaire was used, because it provided the opportunity to derive more information from the respondents. Three sets of questionnaires were developed for the various units of analyses, although,

the mode of administration differed among the different units of analysis. Firstly, the questionnaire was designed and piloted. After it was approved; the questionnaire was piloted. The questionnaires for the container ports were divided into five sections, focusing on the following issues:

- port and container terminal issues
- documentation and information technology issues
- operational issues
- supply chain processes
- management

The questionnaires were sent electronically to seven container ports in Sub-Saharan Africa.

The data was collected through the use of a structured questionnaire that was administered to each of the selected ports. An electronic survey was used as the medium of administering the questionnaires to the shipping lines and freight forwarding companies and humanitarian organisations. One-on-one interviews were also used with the representatives of ports, shipping lines and freight forwarding companies and humanitarian organisations.

#### **2.3.4 Electronic survey**

Two sets of questionnaires were designed electronically; one for shipping lines and freight forwarding companies and the other for humanitarian organisations. These questionnaires were piloted in order to test their efficacy. Electronic surveys were used for the shipping lines and freight forwarding companies and humanitarian organisations. This is because of their user-friendly features and the fact that the survey was internet based. The electronic survey was not used for the ports, because some of the ports did not have stable access to the Internet.

The electronic survey developed for the humanitarian organisations contained a total of 42 questions. The snowball approach was used to administer the questionnaire to the six humanitarian organisations. The questions focused on the following criteria:

- presence in Africa
- types of relief materials sent per region
- process of sending relief materials
- problems encountered at the various ports in sending relief materials that causes increase in cargo dwell time
- need for a guideline
- consideration of other modes of transport

The electronic surveys sent to the shipping lines and freight forwarding companies included a total of 50 questions. The snowball approach was used in administering the questionnaire to the six representatives of the shipping lines and freight forwarding companies. The questions focused on the following criteria:

- coverage in Africa
- ports in Africa used in clearing relief materials
- process of clearing relief materials – case study
- preferential services at the ports regionally
- duration for clearing per port
- problems at the ports regionally
- guidelines
- important factors that should be included in a guideline.

Table 2.1 summarizes the study participant information

**Table 2.1: Study participant information**

Study Participant		Data Obtained	Comments
<b>Ports</b>	Representative		
Port of Cape Town	Brenda Magqwaka (Terminal Executive Manager-Transnet) Joe Cupido (Operations)	Interview Interview	
Port of Durban	John Hyde (National Planning Manager- Transnet) Marvin Chetty (Operations) Sibusiso Mkhize (Operations)	Questionnaire/Interview	
Port of Dares Salaam	Flora Manege (Port Executive)	Questionnaire	
Port of Mombasa	Jeosaphat Thiongo (Port Executive)	Questionnaire	
Port of Walvis Bay	Raymond Visagie Executive Port Operations NAMPORT)	Questionnaire	
Port of Tema	(Dr) Martin Oteng Ababio (Senior Lecturer and	Questionnaire	Facilitated the questionnaire at Ghana

	Coordinator of the Urban Disaster Risk Reduction, University of Ghana, Accra)		
Port of Tema Maranatha	(Dr) Martin Oteng Ababio (Senior Lecturer and Coordinator of the Urban Disaster Risk Reduction, University of Ghana, Accra)	Questionnaire	Facilitated the questionnaire at Ghana
Container Shipping Lines and Freight forwarding Companies			
Mediterranean Shipping Company	Mark Hendricks (Operations Manager)	Interview	
Maersk Line		E-Questionnaire	
CSAV		E-Questionnaire	
Damco Logistics		E-Questionnaire	
Mitsui OSK Lines		E-Questionnaire	
UTI		E-Questionnaire	
SDV-Bollore-Bollore	Yaso Govender (Overborder Controller) Kim Christianson (Operations Manager)	Questionnaire Interview	
Humanitarian Organisation			
CARE	Terry Jeggle (Ex Director at CARE but currently a Senior Officer at United Nations International Strategy for Disaster Reduction)	Interview	
International Federation of Red Cross and Red Crescent Societies- IFRCRC		E-Questionnaire	
United Nations High Commission for Refugees		E-Questionnaire	
Ikra Educational		E-Questionnaire	

Training Centre - IETC			
United Nations World Food Programme		E-Questionnaire	
World Vision International	Walter Middleton (Vice President) Gilbert Nyamutsaka (Commodities Manager)	Interview	Via Telephone

## 2.4 Step-by-Step Process

This section describes the process through which the data was collected from the maritime stakeholders. Information gathering from maritime stakeholders was not an easy task as some were unwilling to divulge information. Even after the questionnaire had been sent, it was necessary to back it up with reminders.

### 2.4.1 Design of the Questionnaire

It was necessary to design three sets of questionnaires for the ports, shipping lines and freight forwarding companies and humanitarian organisations. These questionnaires are provided in the annexures. All the questionnaires were sent electronically.

- Piloting of the Questionnaires

After the set of questions were approved by the supervisor, the electronic questionnaires were tested to ensure that the system worked.

### 2.4.2 Sending out of the Questionnaires

As mentioned, the questionnaires were sent to the ports, humanitarian organisations and shipping lines and freight forwarding companies. It was necessary to get contact details and email addresses of individuals in the selected organisations. This was achieved through networking and relationships developed at conferences; through links and relationships that my supervisor had already established; and through referrals from other sources. The questionnaires were used for the following:

- Telephonic interviews- Several phone calls were made to initially established a relationship with the respondents. After which, the respondent responded to the questions via the telephone.
- On site interviews- Trips were made to the Port of Cape Town, Port of Durban, SDV-Bollere and the Maersk office in Cape Town to interview the respondents.

### 2.4.3 Testing

In order to test the guideline, contact was made with World Vision International, to determine when they were expecting the next shipment of relief materials. World Vision International provided the contact details of the shipping line and freight forwarding company in this case SDV-Bollore that would clear the shipment at the Port of Durban. Observations were made in the Port of Durban to monitor the process. The guideline developed for this thesis was used to test the entire process. This is elaborated on in Chapters seven and eight.

The next section explains how the results were analysed based on the fact that the respondents were selected and the study is based on a case-study approach.

## 2.5 Descriptive Analysis Methodology

The descriptive analysis focused on analysing the results received from the questionnaires sent to the ports, shipping companies and humanitarian organisations. This is done through the use of pie charts, bar charts, histograms and flow diagrams to analyse the data. The results of the analysis are presented and discussed in chapters 5, 6 and 7.

### 2.5.1 Graphical and Numerical Descriptive Statistics

The response of the various maritime stakeholders (shipping lines and freight forwarding companies, ports and humanitarian organisations) were analysed using graphical descriptive statistics. This was based on the advice of Prof Martin Kidd that stated that the sample size was small. Individual data sets for each stakeholder were analysed using Microsoft Excel. The various data sets were analysed as follows:

- Firstly, the results from each set of questionnaires were categorized into three groups based on the maritime stakeholder.
- Secondly, the results from each maritime stakeholder was analysed using graphical techniques based on their response.
- Thirdly, the problems described in the questionnaire and interviews were expressed and explained via flow diagram. The flow diagram tries to describe the process visually.
- Fourthly, pie charts were used to describe the variables and decisions made.
- Finally, tables were also used to show and explain the differences per regions, maritime stakeholders, and variables at a glance. Results are expressed in tabular form.

Figure 2.2 shows the overall research design. This includes the research ideas, research aims and objectives. The research idea originated from experience at a port. The research was divided into three stages. Stage 1 focused on establishing relationship with the respondents. Stage 2 focused on

confirming the salient issues through interviews and questionnaires. Stage 3 focused on testing the impact of the guideline on the respondents.

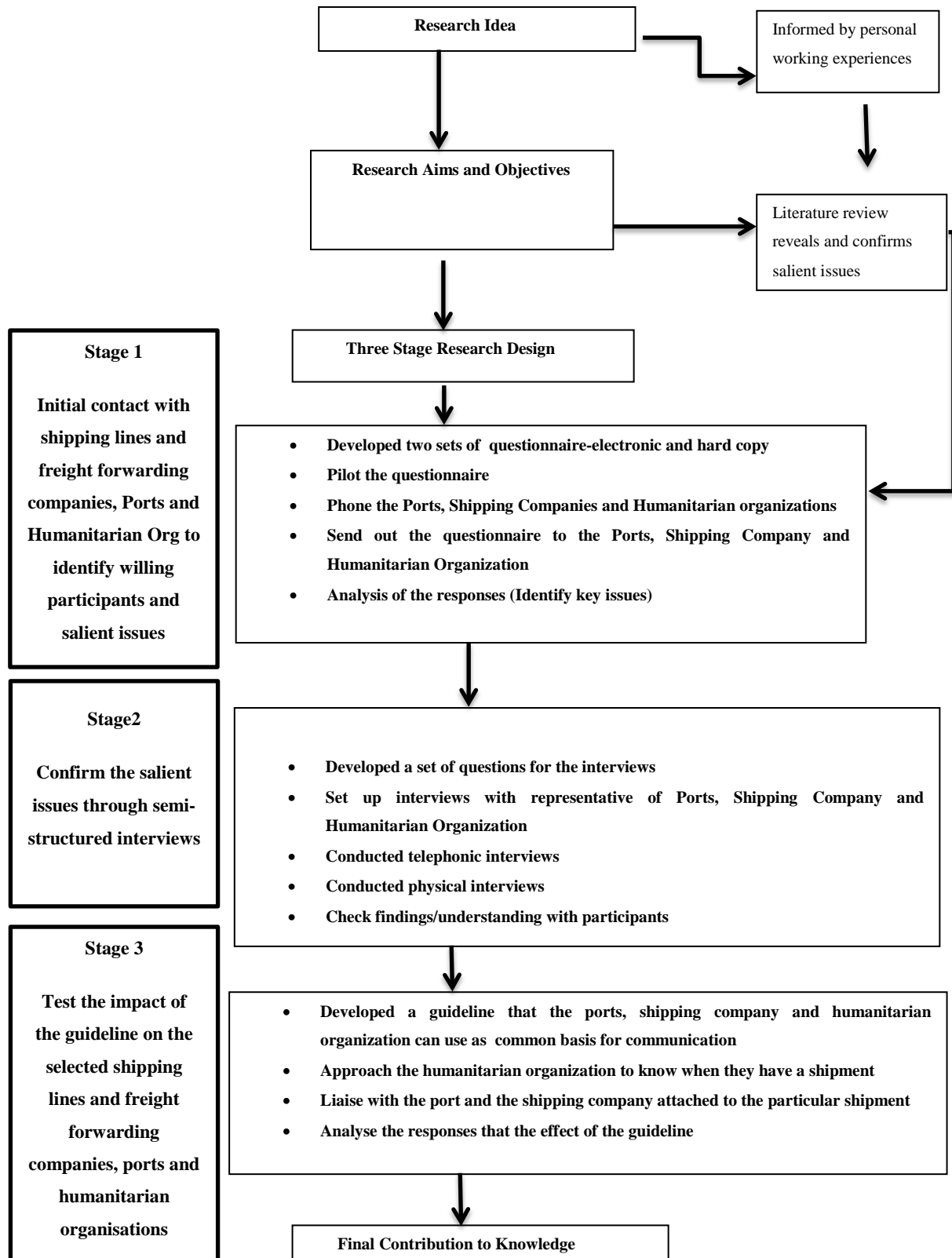


Figure 2.2 The overall research design



## 2.6 Validity: qualitative research methodology

Qualitative research methodology was the most suitable, because it studies human action from the perspective of the social actors themselves (Babbie et al., 2011). The research was conducted in the natural setting of social actors, in this instance selected ports in Sub-Saharan Africa, selected shipping lines and freight forwarding companies and selected humanitarian organisations. The focus is on reducing the cargo dwell time of containers in Sub-Saharan ports.

## 2.7 Triangulation

Triangulation is one of the best ways to enhance validity and reliability in qualitative research. According to Denzin (1994) “triangulation is the use of multiple methods and a plan of action that will raise social science researchers above the personal biases that stem from single methodologies. It involves combining methods and investigating in the same study, observers can partially overcome the deficiencies that flow from one investigation or method”.

Triangulation is important to the study, because it verifies all the information collected during the fieldwork. In order to validate the research, the same set of questions was asked to each of the units of analysis. Their responses were similar. For example, when the units of analysis were asked what problems they faced in the shipment of relief of materials, their responses corresponded with each other. Furthermore, questions such as those on the issue of guidelines that were in place during the interview corresponded with the responses obtained via the electronic survey.

## 2.8 Limitations of study

Certain factors limited the research making it more difficult to obtain the information from the respondents. While some of the respondents were eager and willing to complete the questionnaire and also to be interviewed, others did not complete the questionnaire. Some of the reasons were:

- The respondents were willing, but were also busy.
- Language barriers: some ports are Portuguese-speaking, such as the Port of Maputo in Mozambique.
- Geographical barriers: it was not possible for the researcher to travel to some ports to administer the questionnaire.
- Financial constraints
- Time limitation
- Bureaucracy
- Respondents were not willing to divulge information by virtue of company policies.

- The researcher observed that relief shipments are sensitive and as such the maritime stakeholders are not keen on divulging any information with regards to the relief shipment unless there is trust.
- Weather

## **2.9 Conclusion**

This chapter focused on the research methodology and design used. The process of data collection strategy; data collection and data analysis was explained step-by-step. The tools implemented included interviews, electronic surveys, telephone calls, the snowball approach and the administration of questionnaires. This assisted the researcher in gaining detailed information regarding what processes were followed at the selected ports, among shipping lines and freight forwarding companies and humanitarian organisations in terms of handling relief materials. The data collected was validated through triangulation. Finally, the limitations of the study were highlighted.

## CHAPTER 3: LITERATURE REVIEW

The focus of this literature review is based on the challenges that humanitarian logistics encounters globally. Firstly, this chapter examines the importance of the supply chain of relief materials thereby providing a better understanding of what it entails. Secondly, it identifies the challenges that affect the supply chain of relief materials from a port perspective. Thirdly, it focuses on the different types of disasters and their impact. This is because the type of disaster determines the specific relief materials that will be required, and fourthly, it examines the various stakeholders in the maritime industry.

### 3.1 Supply chain for humanitarian relief

The supply chain of humanitarian relief is the system of organisations, people, technology, activities, information and resources involved in moving a product or service from supplier to customer (Thomas, 2003). The chief task of the humanitarian supply chain manager is to ensure the timely mobilisation of financing and goods from international donors and administering relief to vulnerable beneficiaries at disaster sites across the globe (Thomas, 2003). According to Thomas (2003), the supply chain of relief materials should include the following:

- the preparatory stage
- the assessment stage
- the procurement stage
- the transportation stage
- the distribution stage

#### 3.1.1 The preparatory stage

A disaster is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources (UN,2009; WHO 2008). In the preparatory stage, international aid agencies know the items that are required at times of natural disasters and as a result develop strong relationships with their suppliers and have long-term purchasing agreements. In essence, stock can be pre-positioned (Thomas, 2003). The stock can be positioned at warehouses near to the port of loading.

Preparedness may be defined as “the knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate response to and recover from the impacts of likely imminent or current hazard events or conditions” (UN, 2009).

The following highlights possible ways of preparing:

#### **3.1.1.1 Warehousing**

According to Dignan (2005) the goods that are mostly needed in disaster relief are water, medicine, chlorination tablets, tents, blankets and protein biscuits for malnourished children. Many relief agencies have pre-purchasing agreements with suppliers of drugs, tents, sheeting or blankets (Murray, 2005). These relief materials need to be properly warehoused so that they will not be damaged before they get to the beneficiaries (UNJLC, 2008). The typical flow of relief commodities is through a “port of entry” into a primary warehouse (UNJLC, 2008). The primary warehouse could be at or near the port concerned. From there they are transferred to a forward warehouse holding, where they are transferred to a terminal storage facility and then directly or indirectly delivered into the hands of the beneficiaries (UNHCR, 2007). There will often be circumstances where food or other items are purchased (or exchanged) locally and shipped directly to forward warehouses or terminal stores (United Nations Disaster Relief, 1993).

#### **3.1.1.2 Intermodal links**

In Southern Africa, countries that are landlocked are Botswana, Swaziland, Zimbabwe, Zambia and Lesotho. Relief materials to these countries have to be transported either by road or by rail from the port of discharge.

#### **3.1.1.3 Information technology**

Information technology is a crucial aspect of humanitarian logistics (Sangiamkul and Hillergersberg 2011). This is because it can determine the failure or the success of a disaster relief operation. Stakeholders at the port of destination need accurate information as to when the vessel with the relief materials will arrive. In the early stages of an emergency, the use of fast and cost-effective communication and information systems can aid agencies by allowing them to get the food, medical and other aid to where it is needed most in the shortest possible time (Pettit, Beresford and Whiting, 2011).

#### **3.1.1.4 Cargo-handling equipment**

Cargo handling equipment can assist in expediting the movement of containers. Examples of cargo-handling equipment are:

- gantry cranes
- mobile cranes
- rail-mounted gantries
- forklifts
- reach stackers
- rubber-tyred gantries

- spreaders
- straddle carriers

#### **3.1.1.5 Documentation**

Shippers and humanitarian stakeholders must note that when calling at the port, each port has its own peculiar dues, rates, tariffs and procedures that must be adhered to in order for goods to be cleared promptly (Meersman et al., 2014).

#### **3.1.1.6 Training of port officials**

Natural disaster management requires port officials to be properly trained to handle an emergency (International Federation of Red Cross and Red Crescent Societies, 2000). Lack of proper training of port officials could cause the following (International Federation of Red Cross and Red Crescent Societies, 2000):

- delay in delivering relief materials
- bribery and corruption
- damage to goods
- improper documentation and recording
- waste
- increased costs

#### **3.1.2 The assessment stage**

At the onset of a disaster, humanitarian organisations need to work quickly and accurately to ascertain the supplies required for meeting the relief needs of the affected population (International Federation of Red Cross and Red Crescent Societies, 2000). An assessment team with individual expertise in areas such as water/sanitation, health care and nutrition is dispatched to the disaster areas (Thomas, 2003). A preliminary appeal for donations of cash and relief supplies is usually launched within 36 hours of the onset of the disaster. This appeal provides the basis for large-scale mobilisation of supplies (Tabbara, 2008).

#### **3.1.3 The procurement stage**

At this stage, the food and other necessary commodities may be purchased from any part of the world, depending on the non-governmental organisations and donor agencies involved (World Food Program, 2016). For instance, the United Nations World Food Program (UNWFP) has set up a global network of depots based on disaster characteristics data relating to frequency of occurrence and location. These depots are referred to as the United Nations Humanitarian Response Depots (UNHRDs) (World Food Program, 2016). UNHRDs area create a collaborative venture that exist

between NGOs, governments and United Nations organisations, including World Vision, Mercy Corps US, the World Health Organisation and the UN Office for the Coordination of Humanitarian Affairs (OCHA) (World Food Program, 2016). Supplies from these organisations are stored in the same warehouse. The objective being to provide a quick, effective and cost-efficient deployment of materials into the emergency zones (World Food Program, 2007). By locating the depots in a suitable location, countries in need can be provided with a faster and more cost-efficient emergency response network for emergency relief goods. Emergency stocks of standard relief materials are delivered from the nearest relief warehouses (Fritz Institute, 2005).

### **3.1.4 The transportation stage**

Transportation is important in humanitarian logistics, because it forms the link between the donor of relief materials and the beneficiaries (Mbohwa, 2010). Transport is the link in logistics that makes it possible for emergency humanitarian assistance to reach its destination (Pan American Health Organisation and World Health Organisation, 2001).

The different modes of transportation (ship, road, rail, air) are needed for the efficient management of the humanitarian supply chain (Pan American Health Organisation and World Health Organisation, 2001). For shifting millions of tons of food across the world, ships will continue to be the standard means of transport for the foreseeable future (Pan American Health Organisation and World Health Organisation, 2001). Maritime transport is the most cost-effective mode of transporting the relief materials from the port of origin to the port of destination, because of the volumes involved (Pan American Health Organisation and World Health Organisation, 2001). Once the goods arrive at the local port of entry, there is a need for the goods to be cleared at the port of destination with as little effort as possible.

### **3.1.5 The distribution stage**

When the relief materials have been cleared from the port, they are sent to the various distribution centres where they are distributed to the beneficiaries (World Vision International, 2014). The relief materials can be sent by road or rail to the beneficiaries, so it is important for the port to have a good road and/or rail network. Ports will continue to be an important element in humanitarian emergency relief aid logistics, but how they play this role to a certain extent determines how successful emergency relief aid logistics can be (Pan American Health Organisation and World Health Organisation, 2001).

## **3.2 Challenges that affects humanitarian logistics**

A successful humanitarian operation is one that mitigates the urgent needs of a population within the shortest time and with least amount of resources (Van Wassenhove and Tomasini, 2004).

The following are the reasons why humanitarian operations may not be successful:

### 3.2.1 Agility and Unpredictability

The humanitarian supply chain is agile as well as unpredictable (Oloruntoba and Gary, 2002). The implication of this is that it is flexible in the midst of severe disruption. On the other hand, the supply chain may actually break, therefore, causing the failure of the whole process. The port can contribute to the unpredictability when there are delays in the clearance of shipments at the port of destination. Delays at the port could trigger a crisis. Disruptions of port operations can have a detrimental effect on the supply chains of relief materials (Graves et al., 2009).

Therefore, it is important for ports to be prepared. Ports should be prepared in every aspect depicted in Figure 3.1. Figure 3.1 shows the building blocks of preparedness, as adapted from Tomasini and Wassenhove, (2009).



**Figure 3.1 Building blocks and inter-relationships for preparedness**

Source: Tomasini & Wassenhove, 2009

In preparing for emergency situations, Tomasini and Wassenhove (2009:47) mention building blocks that will ensure effective preparedness. These building blocks consist of the following:

### **3.2.1.1 Human Resources**

It is important that both ports and humanitarian organisations focus on training their personnel. When there is a limited number of trained personnel and staff, it causes many problems when disasters occur. Specialised training is important.

### **3.2.1.2 Knowledge**

The right information with regard to relief materials is important. The International Humanitarian Organization needs to have a good idea of the type of relief materials required in a particular disaster. The officials should also be able to track and trace the inflow of all relief materials at any given time.

### **3.2.1.3 Logistics**

Appropriate skills in process and logistics management are critical. In humanitarian organisations such as the World Food Programme, logistics have played an important role in procurement, warehouse management, training and reporting. In logistics, anticipation is often more important than reaction (James 2008).

### **3.2.1.4. Financial resources**

Sufficient financial resources, rapidly deployable during emergencies (liquidity) and the ability to fund-raise during the disaster or post disaster and continuous preparedness phases (budget forecasting) are essential elements.

### **3.2.1.5 Community**

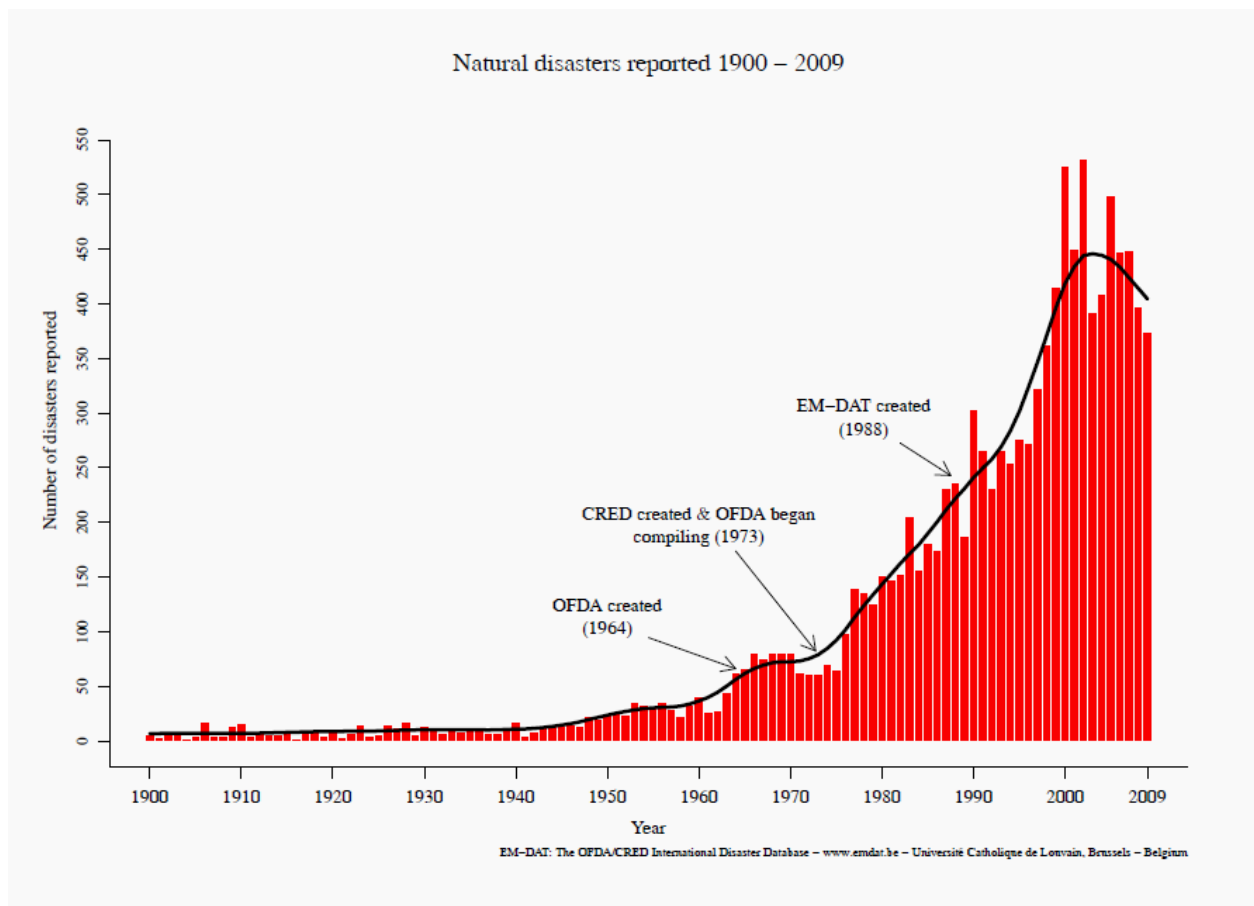
Effective ways of collaborating with other key players (government, military, business and other humanitarian organisations that make up the humanitarian ecosystem) are increasingly important.

Figure 3.1 shows the key factors necessary for preparedness when dealing with natural disasters. The arrows show the links between the different factors and how they are related. The combination of all of these factors is the basis of disaster management.

## **3.2.2 Increase in disasters and conflicts**

The increase in the spate of disasters can be daunting (Kovacs and Spens, 2009). Over the past 30 years, the number of reported natural disasters has increased steadily, from slightly fewer than 100 in 1974 to slightly more than 400 in 2003; an increase of almost four fold (CRED, 2014). Figure 2.2 shows the trend in natural disasters from 1900–2009. From a port perspective, the increase in disasters has an implication for ports in terms of infrastructure, facilities and manpower.





**Figure 3.2 Natural disasters reported 1900-2009**

Source: EM-DAT: The CRED international disaster database 2011

### 3.2.3 Increase in the number of people affected

Over the years the number of people affected by natural disasters, specifically in Africa, has increased (CRED, 2014). Table 3.1 shows the increase in disasters from 2000-2011.

**Table 3.1: Increase of disasters from 2000 – 2011**

S/N	COUNTRY	DISASTER TYPE	NUMBER OF PEOPLE AFFECTED
1	Botswana	drought epidemic flood local storm	171 071
2	Lesotho	drought storm	983 335

3	Namibia	drought epidemic flood	1 170 456
4	South Africa	epidemic extreme temperature flood local storm wildfire	15 362 478
5	Swaziland	flood drought storm epidemic wildfire	1 665 134
6	Mozambique	drought earthquake epidemic extreme temperature flood insect infestation volcano	11 013 391
7	Madagascar	drought seismic activity epidemic extreme temperature flood storm wildfire	6 262 286
8	Malawi	drought flood storm epidemic	9 834 085

9	Angola	drought epidemic flood	1 215 894
10	Zimbabwe	drought epidemic seismic activity wildfire flood volcanic eruption	10 226 970
11	Zambia	drought seismic activity epidemic flood	4 254 187
12	Ghana	epidemic flood	717 033
13	Kenya	drought earthquake (seismic activity) epidemic flood	8 657 082
14	Uganda	drought epidemic flood mass movement (wet/dry)	4 473 610
15	Djibouti	epidemic drought epidemic flood	853 731

Source: The International Disaster Database for Center for Research on the Epidemiology of Disasters, Belgium, 2014

### **3.2.4 Lack of infrastructure**

Cargo handling equipment may not be enough to handle the flow of cargo. In addition, the cargo handling equipment may not be in good condition (Ntibarekerwa, 2008). This causes delay at the ports (Ntibarekerwa, 2008).

### **3.2.5 Lack of Communication**

Ports have various policies that govern how cargoes are cleared (Jeggle, 2012). Most humanitarian officials may have to rely on shipping agents to assist in clearing the relief materials. Delay arises when the humanitarian organisation does not provide the shipping agents with all the required documents to facilitate the clearing of the relief materials (Jeggle, 2012). In addition, lack of understanding on the necessary documents can lead to delays in the clearance of shipments (Jeggle, 2012).

### **3.2.6 Port Congestion**

Talley (2006) defines port congestion as the period “when port users interfere with one another in the utilization of port resources, thereby increasing the time spent in the port. Port congestion can be intentional or unintentional”. Talley (2006) further differentiates between the two categories of congestion, namely, intentional and unintentional:

Intentional congestion occurs when there is pre-emptive priority. For example, when a port grants priority to ships or vehicles transporting a certain type of cargo over ships or vehicles transporting another type of cargo. Unintentional congestion occurs when the demand for the use of a port resource exceeds its supply. This type of congestion occurs in the normal utilization of port resources. Port queuing (waiting time) costs are part of congestion costs (Talley, 2006).

## **3.3 Natural disasters**

According to UNISDR (2004) “a disaster is a sudden, calamitous event that causes serious disruption of the functioning of a community or a society causing widespread human, material, economic and/or environmental losses, which exceed the ability of the affected community or society to cope using its own level of resources”. “The combination of hazards, vulnerability and inability to reduce the potentially negative consequences of risk results in disaster” (European Commission, 2006).

It is widely accepted that a disaster is multifaceted and open to a range of different interpretations. Disaster synonyms used by practitioners and experts include “calamity” and “catastrophe”. Similar words are “emergency” and “crisis”. Disasters are “abrupt shocks to the socio-economic and environmental system, involving loss of life and property” (European Commission, 2006).

For a disaster occurrence to be entered into the database of the UN's International Strategy for Disaster Reduction (ISDR), at least one of the following criteria needs to be met (UN, 2009):

- a report of ten or more people killed
- a report of 100 people affected
- a declaration of a state of emergency by the relevant government
- a request by the national government for international assistance

According to World Bank IEG (2006), “natural disasters occur throughout the world, but their economic and social impacts have been increasing and are generally much greater in developing countries than in developed ones. Disasters can wipe out development gains and eclipse years of development investment”. Prior to the present, disasters were treated as one-time, random events by governments and the agencies that helped them responded accordingly. Currently, disasters strike with regular periodicity — and repeatedly in some parts of the world. The potential for disaster is foreseeable to the extent that it is possible to predict generally where an event is likely to occur at some time in the near future (but not precisely when or what its magnitude will be) (World Bank IEG, 2006).

### 3.3.1 Effect of natural disasters

When a natural disaster occurs, it affects the economy as a whole. This section explains the effect of natural disasters on the various sectors. Table 3.2 shows the various sectors of a country or state that are affected when a natural disaster occurs at a glance. Natural disasters may affect the following aspects of the economy (Pan American Health Organisation and World Health Organisation, 2001):

- food and nutrition
- infrastructure
- communicable disease
- social reaction
- water supply and sewage
- exposure to elements
- mental health
- displacement

**Table 3.2 Impact of natural disasters on various sectors**

S/N	SECTOR	NATURAL DISASTER IMPACT
	Food and	<ul style="list-style-type: none"> <li>• Food stocks reduced for both personal food stock and community food in the area</li> </ul>

	nutrition	<ul style="list-style-type: none"> <li>• River floods and unusually high tides causing coastal flooding may affect food stocks and ruin crops, as well as interfering with distribution. Food supplies are not enough and deplete quickly</li> </ul>
	Infrastructure	<ul style="list-style-type: none"> <li>• Natural disasters frequently cause severe damage to key facilities, thus affecting the health of those sectors of the community that depend on the services provided. As a result of the damage to roads, railway lines and bridges, supplies cannot get to the affected communities</li> <li>• Hospitals, health centres, schools are affected</li> </ul>
	Communicable disease	<ul style="list-style-type: none"> <li>• Increase in the odds of infectious diseases spreading</li> <li>• Increase in morbidity is frequently the result of faecal contamination of drinking water and food, causing gastrointestinal diseases.</li> <li>• The risk of contamination grows - as in the case of refugee camps - since existing sanitation services such as water supply and sewerage systems break down and it becomes impossible to maintain or restore public health programmes.</li> <li>• In the case of complex disasters, malnutrition, overcrowding, and the lack of basic sanitary conditions are frequent. In such circumstances, outbreaks of cholera and other diseases have occurred.</li> </ul>
	Social reaction	<ul style="list-style-type: none"> <li>• The behaviour of disaster victims rarely explodes into general panic or sinks into stunned apathy.</li> <li>• After the initial shock, people tend to start acting positively in order to meet well-defined personal goals, leading to an increase in individual activities that, in spite of being spontaneous, quickly self-organise into collective endeavours</li> <li>• Engaging in search and rescue efforts, often within minutes of the impact</li> <li>• Self-organised groups in a matter of hours assign themselves specific tasks that play a key role in relief and recovery.</li> </ul>
	Water supply and sewage	<ul style="list-style-type: none"> <li>• Water supply and sewage systems are especially vulnerable to natural disasters. The interruption of such services leads to severe health risks.</li> </ul>
	Exposure to	<ul style="list-style-type: none"> <li>• Exposure to the elements such as the wind and cold.</li> </ul>

	elements	<ul style="list-style-type: none"> <li>• Emergency shelter is required</li> </ul>
	Mental health	<ul style="list-style-type: none"> <li>• In the immediate aftermath of a disaster, anxiety, neurosis and depression can set in</li> <li>• A significant increase in mental health problems often accompanies the long-term rehabilitation and reconstruction phase. Treatment needs to be provided.</li> </ul>
	Displacement	<ul style="list-style-type: none"> <li>• Large population displacements take place; humanitarian assistance becomes crucial and urgent.</li> <li>• People tend to flock to urban areas, where public services do not have the capacity to handle sudden, very large increases in the population served, leading to increased mortality and morbidity rates.</li> <li>• If the disaster destroys most homes in a given area, large local “migrations” may take place within the same urban environment, as victims look for shelter in the homes of relatives and friends</li> </ul>

Source: Diagram developed by the author in February 2012. The content comes from PAHO/WHO, 2001:3-5.

### 3.3.2 Disaster life cycle

Time is an important factor in disaster situations (James, 2008; Tomasini and Van Wassenhove, 2009a). This is because when humanitarian relief personnel are unable to reach the site of disaster on time with the required resources, lives may be lost. There are various stages in the disaster situations. These stages are categorised based on how urgently the relief materials and personnel are required to be received at the location of the disaster. The disaster life cycle shows the degree of urgency of the disaster situation. According to Tomasini and Van Wassenhove (2009a), there are three stages in a disaster life cycle. They are:

- ramp up
- sustain
- ramp down

#### 3.3.2.1 Ramp up

During the ramp up stage, “the disaster has just occurred and many humanitarian officials are sent to do needs assessment and give feedback”. The feedback will determine the type of relief materials and personnel that will be required to save lives. Tomasini and Van Wassenhove (2009a), mention that because of the urgency of the disaster that has just occurred, time is critical and all bottlenecks should be removed. Bottlenecks could take the form of bureaucratic procedures, obtaining visas, negotiating

landing rights, obtaining customs clearance, or arranging licences for vehicles and a variety of other paperwork.

### **3.3.2.2 Sustain**

According to Tomasini and Van Wassenhove (2009a), during this stage in the disaster, the mission is clearer and the population target is focused. “The aim is to get the necessary aid to the people immediately. This is the second stage of intervention. It describes the consensus environment that requires individual agencies to sign off on acceptable coordination solutions. Coordination by consensus is when organisations have access to compatible or shared communications equipment, liaison and inter-agency meetings and pre-mission assessments (Tomasini and Van Wassenhove, 2009a). For example, as the bottlenecks are cleared and all humanitarian organisations are operational, their focus will shift to fulfilling their own specific mandate (e.g. foodstuff, health and water) and ensuring a sustained operation” (Tomasini and Van Wassenhove, 2009a).

### **3.3.2.3 Ramp down**

According to Tomasini and Van Wassenhove (2009a), this is the third and final stage and it describes “light coordination”, because of its hands-off nature. “It involves only the collection and dissemination of information through frequent contact between the different actors. At this stage, each individual agency is focused on managing the handover and exit. Coordination will still happen, but only occasionally, and in a sense by default. It tends to happen naturally in the field as humanitarians from one organisation swap ideas, help and advice those from other organisations.”

## **3.4 The Supply Chain of Relief Materials: Role of the Maritime Stakeholders**

### **3.4.1 The Adoption of Disaster Management Procedures at the Port**

This section focuses on how best the port can reduce the dwell time of containers, especially during crises and emergencies. This is where the role of disaster management is crucial. Disaster management is the result of a long and structured process of strategic process design (preparedness) that ultimately drives successful execution (response) (Tomasini and Van Wassenhove, 2009a). It is important for ports to have disaster management procedures and policies. Preparation prevents ‘fire fighting’. Fire fighting is a situation whereby understaffed and underequipped organisations try their best, but having incomplete solutions, problems recur and cascade (Tomasini and Van Wassenhove, 2009a).

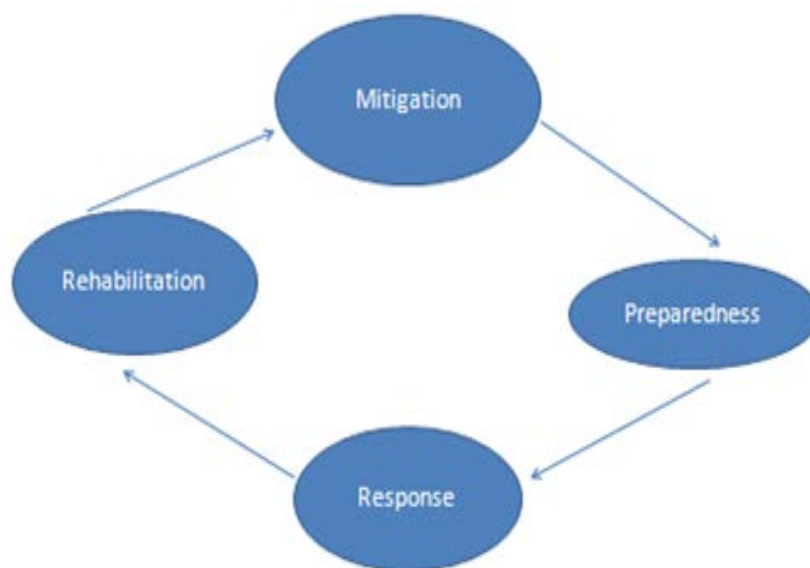
According to Tomasini and Van Wassenhove (2009a), Humanitarian relief supplies are the resources required when disaster strikes. The type and quantity of humanitarian relief supplies are usually determined by two main factors:



- the type of disaster, since disaster events have different effects on the population
- the type and quantity of supplies that were available in national inventories prior to the occurrence of a disaster

Immediately following a disaster, the most critical health supplies are those needed for treating casualties and preventing the spread of communicable diseases. From the onset of the disaster, this is considered the emergency stage. Supplies required will include sanitary engineering equipment, food, shelter and construction materials. Usually the first humanitarian assistance shipments will arrive at a country's main entry points or ports within 24 to 72 hours after the event, but unloading, sorting, storage and distribution of supplies will take much longer".

The main problem in the least economically developed countries is not the acquisition of large quantities of new supplies in the event of a disaster, but rather taking advantage of these using locally available resources. Identification, sorting, classification, inventory, storage, transport and distribution of items pose major challenges (Tomasini and Van Wassenhove, 2009a). The disaster management process includes four steps: mitigation, preparedness, response, rehabilitation. Figure 3.3 shows the disaster management cycle.



**Figure 3.3 The disaster management cycle**

Source: Humanitarian Logistics Tomasini and Wassenhove 2009.

#### **3.4.1.1 Mitigation**

Tomasini and Van Wassenhove (2009a) defined mitigation as “the proactive social component emergencies, and includes laws and mechanisms that reduce the vulnerability of the population and increases their resilience”.

### **3.4.1.2 Preparedness**

Tomasini and Van Wassenhove (2009a) define preparedness as “putting in place the response mechanism to counter factors that society has not been able to mitigate (withstanding risks and vulnerability)”. The fundamental principle of preparedness is that when disasters occur, it demands the immediate response regarding the right goods at the right time, delivered to the right place and distributed to the right people. The ports need to be prepared in the following key areas, {Adapted from, (Tomasini and Van Wassenhove, 2009a)} “which serve as the building blocks of preparedness:

- Human resources – key port officials to be trained in disaster management
- Knowledge management – ordering transmission and ordering tracking of the physical flow of goods in order to limit theft
- Logistics – the physical flow of relief materials from the ports to distribution centres
- Financial resources – payment schedules, consignment arrangement, reward mechanism
- Community – effective collaboration with other key players that make up the humanitarian ecosystem”.

### **3.4.1.3 Response**

A port’s response to a natural disaster must be proactive and not reactive. Tomasini and Van Wassenhove (2009a) define response as “the act of attending to the natural disaster. From the logistical point of view, response during a disaster is complex. Port officials as well as humanitarian workers are faced with the unknown and with not knowing when and to what extent the next disaster will happen; even worse, they do not know how many people will be affected or for what period of time.” Therefore, the response of the ports should be to have proactive flexible policies that can be adjusted to suit the complexities that disasters bring.

### **3.4.1.4 Rehabilitation**

Tomasini and Van Wassenhove (2009a) define rehabilitation as “coming after the response, when society, supported by surviving institutions and infrastructures, seeks to restore some form of normalcy to the lives of the victims. Rehabilitation materials may need to be imported via the ports”.

## **3.4.2 Container ports**

Notteboom and Yap (2012) define the port as “a logistics and industrial centre of an outspokenly maritime nature that plays an active role in the global transport system (for containerized cargoes) and that is characterized by a spatial and functional clustering of activities that are directly and directly involved in ‘seamless transportation and information process in production chains.’” This subsection focuses on container ports. This is because relief materials are predominantly transported via container ports (Bestenbreur, 2012). Container ports serve as an important node in facilitating the efficient flow of containerized cargoes (Notteboom and Yap, 2012). The container port is further

differentiated by its functions, which consists of serving primarily as a gateway port that acts as an interface between hinterland and deep-sea routings of containerized cargoes, or of serving primarily as a transshipment port that acts as an interface for interchange between deep-sea routings of containerized cargoes (Notteboom and Yap, 2012). Talley (2009) explains the various operations in a container terminal. These include:

- “the loading and unloading of containers to and from ships, rail cars and trucks
- loading (stuffing) of cargo into containers
- unloading (stripping) of cargo from containers
- the loaded containers leave[ing] the container port (via a ship or an inland carrier) as ‘finished products’, referred to as the container throughput of the port”.

According to Talley (2009) the functions of the container terminal are to:

- “control the inventory of arriving and departing containers
- maximize its container throughput in the utilization of given levels of resources labour and equipment)
- minimize the time the containers are in port hence being able to handle more containers and increasing its containers throughput
- minimize the number of times containers are moved and the time in storage in the port”.

### **3.4.3 Container port operations**

At a container terminal there are five major operations that take place from the time the vessel is at anchorage to the time the vessel has discharged/loaded and sets sail.

By the time the vessels arrive, the relevant information with regards to the vessel has been sent electronically. This may be through the use of electronic data interchange (EDI). The vessel’s arrival time and relevant information about the container, for instance, description of its cargo are recorded (Transnet, 2013).

According to Bestenbreur (2012), the following are the key operations in a container port: Vessel discharge loading operations

- Quay transfer operations  
The container will then be loaded / unloaded from the ship with the use of a ship-to-shore crane and placed in the port’s apron, the staging location. These are operations that refer to the transfer of containers from the quayside to the stacking areas or vice versa. This is done for exported containers as well as for imported containers, taking place from the stacking area to the quayside or from under the crane to the stacking area.

- Container yard operations

These are operations that involve the positioning of the container into a container stacking yard before being loaded onto the vessel as export, or before being moved out of port as imports or being loaded onto another vessel as transshipment.

- Road-rail-waterways collection delivery operations

These are all the necessary actions that allow the container to be loaded or unloaded onto a truck (road transport) or train or water barge. Container ports that have on-site rail services also have rail entry and departure gates for trains transporting containers to and from the port. In ports that have inland water and coastal container barge services, barges are usually loaded and unloaded at the same wharf as the container ships. For example, ports in Europe such as Rotterdam or Antwerp.

- The gate in/out operations

This mostly relates to road transport. It refers to all the documentation necessary for the container to be loaded onto a vessel for export, or loaded onto a truck as an import. The inland interchange gate allows for the entry and departure of containers by land (or inland waterways) to and from the ports. Imported or exported containers are subject to inspection for proper documentation and security requirements. The inter-truck gate refers to the point where the over-the-road and drayage trucks are received into and dispatched from the container port. These gates consist of entry and departure gates. For instance, a truck may arrive at the entry gate with a chassis loaded with a container. At the truck entry gate, relevant information regarding truck movements is recorded. For example, information on the containers being hauled, the ships on which the containers will be loaded and the trucks and their chassis hauling the containers.

### **3.4.4 Storage of containers in the port**

Containers can be stored in the following places in the port area (Talley, 2009):

- On chassis
- In dedicated stack storage location

#### **3.4.4.1 On Chassis**

This is a trailer on which a container is carried when transported by a truck. Chassis storage is also referred to as an all-wheeled storage operation (Talley, 2009). This form of storage has a time advantage over stack storage for inland carriers and also saves time for the port. This is because over-the-road truckers, while in ports, do not have to wait for a container to be placed on the chassis, as opposed to stack storage, for departure from the port. In this type of storage system, the containers

are in storage for a shorter period of time. The disadvantage of this type of storage is that it utilises a great deal of land (Talley, 2009).

#### **3.4.4.2 In dedicated Stack storage location**

The containers are stored at a given location in the port. These containers are stacked on top of each other. For instance, they can be stacked five-high, as happens in the Port of Cape Town, which tries to optimise land space (author's fieldwork, 2011). The disadvantage of this is that movement of containers can be cumbersome and time-consuming. This is also capital-intensive as it requires specialised yard equipment for stacking and unstacking containers.

#### **3.4.5 Productivity measurements/indicators and best practice**

The basic function of a container terminal is the transfer and storage of containers (Rodrigue, 2013). Terminal operators want to maximise operational productivity and land space as containers are handled at the berth and in marshalling yards. Container handling productivity is directly related to the transfer functions of a container terminal, including the number and movement rate of quayside container cranes, the use of yard equipment and the productivity of workers employed in waterside, landside and gate operations (Le-Griffin and Murphy, 2006).

According to Le-Griffin and Murphy (2006), productivity in a container terminal may be influenced by internal and/or external factors.

Internal factors are those situations that are under the control of the operations, namely:

- terminal configuration and layout
- capital resources
- labour productivity

External factors are those situations that are beyond the control of the operators, namely:

- trade volumes
- shipping patterns
- ratio of import to export (which influences the number of empty containers handled at a terminal and the availability of container chassis)
- the size and types of ships accommodated at the terminal
- landside capacities
- performance of intermodal rail and highway systems
- natural disasters
- wind (which affects productivity at certain ports, e.g. the Port of Cape Town and Durban).

According to Le-Griffin and Murphy (2006), the following highlights common productivity measures for container terminals:

- Crane
  - Crane utilisation: number of container moves per crane per year
  - Crane productivity: container moves per crane per hour
- Berths
  - Berth utilisation rate: movement of containers across the quay and through the storage and the marshalling yards, i.e. the annual number of containers per metre quay length
  - Service time: the time required to service a vessel
- Yard
  - Land utilisation: number of containers handled per hectare of terminal area
  - Storage productivity: number of TEUs per storage acre
- Gate
  - Gate throughput: the number of containers per hour
  - Truck turnaround time: the time a truck spends in the terminal from gate-in to gate-out
- Gang
  - Labour productivity: the number of moves per man hour (Le-Griffin and Murphy, 2006).

Best practice refers to the processes, procedures and measures designed to improve performance in port operations (ASEAN Ports Association, 2003). The following are areas where best practice can be measured (ASEAN Ports Association, 2003):

- **“Entity responsible for cargo handling**  
Types of skilled and unskilled labour employed in cargo handling: For instance, there are ports that make use of cargo handling equipment on a large scale, while there are some ports that make use of unskilled labourers. These labour intensive systems of cargo handling require the employment of foremen, tallymen, signalmen and timekeepers (ASEAN Ports Association, 2003).
- **Operators that handle cargo handling equipment**
  - Forklift operators
  - Mobile crane operators
  - Reach stacker operators
  - Prime mover operators
  - Trailer operators

- **Skills acquisition**

This implies how cargo handling and related skills are acquired. They may be acquired in the following ways (ASEAN Ports Association, 2003):

- experience
- formal training
- on-the-job training

- **Port workers' compensation and benefits**

When Port Management enacts a policy, it can be implemented only by those in the cadre of the organisational hierarchy. "If port employees are not well motivated, then port productivity will be low and it is even possible that congestion will occur" (ASEAN Ports Association, 2003).

### **3.5. Humanitarian sector**

Humanitarian organisations play a crucial role in the supply chain of relief materials. The humanitarian sectors are often divided into several areas, including activities that address "immediate survival needs protection, rehabilitation and development and involve several cross-cutting themes" (James, 2008). According to James (2008), the following sections are the major contributors of humanitarian organisations:

- "Essential sectors: food and nutrition; health; water and sanitation; shelter
- Protections: refugees and the internally displaced, psychosocial projects and specifically targeted programs
- Rehabilitation and development: infrastructure rehabilitation, education and microfinance development
- Cross-cutting themes: community participations, gender based violence,
- sustainable livelihoods, demobilisation of ex-combatants and disaster
- preparedness and mitigation".

#### **3.5.1 Other essential sectors**

The focus of this section is on the essential sectors, as these relate to ports. This is a primary focus of this research as these essential commodities can be transported via the sea and cleared at the ports. The following are the essential sectors that are covered in this section:

- food and nutrition
- agriculture
- health

- shelter
- other relief materials
- water

#### **3.5.1.1 Food and nutrition**

Disasters often blocks access to food, which then leads to malnutrition. Malnutrition is a major cause of morbidity and mortality (James, 2008). This is why international agencies focus on providing food to an entire population. Food security relates to people's access to the food required at any time in order to achieve an active and healthy life. Lack of knowledge and information, poor health care and other factors contribute to food insecurity (James, 2008). Famine prevents people from having access to food. This creates food insecurity, as a result of which malnutrition occurs. Malnutrition includes a range of medical conditions where people do not receive enough nutrients and where normal physical and mental development are impaired (James, 2008).

#### **Types of food**

According to James (2008) there are different types of food commodities and supplements that can be imported to prevent food insecurity and malnutrition. They are:

- maize
- wheat
- rice
- UNIMIX
- BP5
- corn soya based (CSB)
- plumpy nut
- grains such as sorghum, millet, maize and rice

#### **3.5.2.2 Agriculture**

According to Israel and Briones (2013), "natural disasters impact the agriculture and environment sector. On the positive side, typhoons and floods directly increase the moisture content in the air, resulting in a temporary cooler temperature for the local people to enjoy. On the negative side, typhoons, floods and droughts can reduce the affected area's total vegetative cover; typhoons and floods lead to soil erosion, higher coastal tides and storm surges; floods result in siltation and sedimentation, accumulated waste, polluted water and deformed land topography; while droughts reduce rainfall, lower soil fertility and increase saltwater intrusion" (Israel and Briones, 2013). Taken together, all three of these phenomena indirectly reduce the viability of both land and water ecosystems as suppliers of ecosystem services and endanger human health and safety with the proliferation of natural disaster-related diseases.



The International Humanitarian Organisation can offer relief in the following areas (James, 2008):

- seeds
- fertilizers
- tools such as axes, hoes, picks, rakes and shovels
- livestock such as cattle, camels, fowls, goats, pigs and sheep.

These provide the people with a number of key resources that can serve as ‘seeds’ to regrow herds and flocks.

### **3.5.2.3 Health**

According to the WHO (2008), health is defined “as a dynamic state of complete physical, mental, spiritual and social well-being and not merely the absence of disease or infirmity”. The attainment of the highest possible level of health requires action of many other social and economic sectors such as nutrition, shelter, water and sanitation. James (2008) states that when disaster occurs, it can affect health in the following ways:

- “decline in access to health services because of disaster or insecurity
- rise in emergency related health needs, such as trauma, wounds and other life-threatening cases, especially at a time when the ability to meet these needs are reduced.
- sexual violence – rape
- inadequate or non-existent social services infrastructure, including health facilities that are damaged or destroyed from natural disasters
- health workers being forced to flee
- inability to follow schedule-related health care such as immunizations and directly observed therapy (e.g. Tuberculosis)
- supplies and equipment destroyed or looted
- reduction in the ability to carry out public health measures such as education and promotion”.

### **3.5.2.4 Shelter**

A natural disaster such as an earthquake and certain types of conflict may destroy homes. Shelter is of importance especially in extreme weather conditions and mass population displacement (James, 2008). According to James (2008), “the provision of shelter is more than supplying a roof. For shelter to be inhabitable it must protect against the environmental elements; accommodate sleeping materials; clothing and other supplies. Shelter must provide warmth and provide for cooking facilities, water and sanitation”. Harsh temperatures and heavy precipitation can accelerate the need for adequate shelter. Shelter must also be culturally appropriate to preserve the health of the inhabitants and provide privacy, dignity and security (James, 2008).

### **3.5.2.5 Relief materials**

In instances where natural disasters destroy houses, James (2008) mentions the various types of shelter units (tents) that can be imported:

- ridge tent: traditional relief tent
- centre pole tent
- hoop tent (tunnel-shaped)
- frame
- nomadic/traditional shelters

Once shelter has been erected, people will need household items, including mattresses, blankets, clothing, lamps, buckets/water containers, cooking and eating sets, means of controlling vectors (insects that carry germs), heaters and stoves. Stoves should be selected according to ease of use and efficiency, for instance, prefabricated stoves that can serve as heaters and cookers (James, 2008).

### **3.5.2.6 Water**

According to James (2008),” people prefer to drink clean, clear, good tasting and odourless water. However, when natural disasters occur it affects the quality of the water. Water contamination can occur at the source or during the transportation of the water, thereby leading to waterborne infections such as Dysentery; Cholera and Typhoid”. As a result of contamination there is need for water testing.

Water testing takes about 24 hours when water testing kits are used. These water testing kits are made by Delagua/Oxfam and test for bacteriological contamination, Chlorine, pH balance, turbidity and temperature (James, 2008). All of these aforementioned materials need to be imported as well as the chlorine compounds (Calcium hypochlorite).

## **3.6 Relief kits**

Relief kits are developed by a team of agencies for emergency situations (James, 2008). There are various types of kits that have been developed to suit various emergency situations. Below is a list of the various types of kits available:

- emergency health kits
- children’s recreational kits
- basic family water kits
- school-in-a-box
- UNFPA reproductive health kits

### **3.6.1 Emergency health kit**

The kit is available from the World Health Organisation (WHO) or United Nations Children's Fund (UNICEF, 2005; James, 2008). According to James (2008), the relief kit was “developed by a team of agencies for emergency situations where there is no working medical facilities to meet the primary health needs of 10,000 persons for three months or 30,000 persons for one month. A basic manual (treatment guidelines) comes with each kit intended for training purposes”.

The basic unit consists of 10 identical boxes, each weighing 41 kg and costing approximately \$2 194 (UNICEF, 2005; James, 2008). The basic unit is intended for primary health workers and contains basic supplies including 12 non-injectable drugs.

The supplementary unit is used only by professional health workers or physicians. It contains drugs that may need import authorisation and drugs (anti-malarial) that need to be stored at a specific temperature (cold chain).

According to James (2008), the supplementary unit contains the following:

- 12 non-injectable drugs
- 3 boxes of medication
- 5 boxes of infusions
- 3 boxes of renewable supplies
- 3 boxes of equipment

### **3.6.2 Children's recreational kits**

UNICEF's recreational kit contains twenty-one separate parts: thirteen teacher's items and eight student's items packed in a metal box weighing 28 kg. The recreational kit is designed to serve up to 90 children playing simultaneously (James, 2008).

### **3.6.3 Basic family water kit**

UNICEF's basic water family kit is designed to be sufficient for ten families. The kit weighs 21 kg and contains collapsible water containers, buckets, soap and water purification tablets (James, 2008).

### **3.6.4 School-in-a-box**

Restocking and reopening schools is a critical emergency and post-conflict task. UNICEF's school-in-a-box kit for 80 students has 37 components: 26 teachers' items and 11 students' items. It weighs 52 kg. School-in-a box comes in a steel lockable box. There is also school-in-a-container that contains the same content, but comes in a cardboard box (James, 2008).

### 3.6.5 United Nations Population Fund (UNFPA) reproductive health kits

These kits are designed to help implement reproductive health activities, including sexual health, post-rape management and medical supplies for the safe delivery of babies (James, 2008).

### 3.7 Humanitarian logistics: NGO perspective

This section highlights the logistics activities from the perspective of non-governmental organisations (NGOs). NGOs' logistics activities consist of procurement, shipping, storage, distributions maintenance and disposal of goods and supplies to be used for humanitarian aims. These logistical activities may be thought of as a chain that brings the required supplies to staff and beneficiaries. At every point along an NGO's supply chain there are unique constraints that make logistics in an emergency context especially challenging. These include urgency, insecurity, remote locations, scarce resources and overwhelming needs (James, 2008).

James (2008) came up with the "Ten Golden Rules of Logistics" that are applicable to NGOs. Table 3.3 shows how the 'golden rules' may be applied to NGOs. Effective humanitarian relief management is based on anticipating problems and responding to them as they arise, and providing specific supplies at the right time where they are most needed (Pan American Health Organisation and World Health Organisation, 2001).

**Table 3.3 The ten golden rules of logistics for NGOs**

	<b>RULES</b>	<b>NGOs</b>
1	Plan ahead	Spend time determining future needs and also make allocations; for example, the season (monsoon flood) indicates the likelihood of floods. This means preparing a plan to put the supplies in the hands of those who need them and where they need it.
2	Follow procedures	Establishing and implementing procedures make managing activities more streamlined and efficient. Procedures have to be established.
3	Documentation	Records should be kept for the purpose of transparency. Donors want to see how their money was spent. Records should be kept all along the supply chain.
4	Communicate	Continuous communication with members of staff as to all the activities and processes should be maintained.

5	Standardise	The process and procedure should be uniform. A standard computer radio vehicle makes it easier for ordering replacements and spares. Identical kits and packages are simpler to send through the supply chain.
6	Test	Never send anything to the field that has not been tested or checked. This is to ensure that the item is fully functional and is complete regarding parts and accessories. This includes turning electronic items on and testing batteries before shipping them out.
7	Maintenance	Once an item is fielded, maintenance must be planned for. Even the sturdiest items need to be maintained, so, sufficient budgeting funds must be allocated for repairs.
8	Buying locally	Buying local items can be cheaper, faster and easier. However, items such as vehicles, water testing kits, computers, some medical equipment and radios need to be shipped.
9	Have a back-up	There should be duplicates of important items.
10	Monitoring	At each step along the supply chain potential problems exist. Consequently there is a need for constant attention to clear bottlenecks and other obstacles.

Source: Adapted by the author from James, 2008:228

### 3.8 Humanitarian organisations

There are many humanitarian organisations whose focus and function are to help in situations of natural disasters and complex emergencies. This section focuses on selected humanitarian organisations and their roles in disaster situations. Twenty humanitarian organisations are highlighted in Table 3.4.

**Table 3.4: Humanitarian organisations**

S/N	HUMANITARIAN ORGANISATION	FUNCTIONS
1	The United Nations Development Programme (UNDP)	Promotes and supports disaster preparedness activities in member countries. The Country Office may also co-ordinate a disaster management team

		(UN-DMT) comprising representatives of the various United Nations agencies, whose goal is to provide effective and co-ordinated assistance to governments in the wake of a disaster and during subsequent recovery and reconstruction efforts.
2	The United Nations Office for the Coordination of Humanitarian Affairs (OCHA)	An advocate for the rights of disaster victims and other affected groups, it also promotes prevention and preparedness, and encourages sustainable solutions to the problems posed by natural or manmade hazards.
3	United Nations Disaster Assessment and Coordination (UNDAC)	Carries out rapid assessment of priority needs and supports the national authorities and the United Nations Resident Coordinator in the co-ordination of international relief aid on the ground.
4	The World Food Programme (WFP)	Provides and co-ordinates food assistance and is frequently assigned the co-ordination of general logistics in large-scale emergencies.
5	United Nations Children's Fund (UNICEF)	Focusing on the health, education and welfare of women and children in developing countries, it has mechanisms in place to cover their needs during emergencies, including food, water, sanitation, health care and social services.
6	The Pan American Health Organisation (PAHO)	PAHO and other regional WHO offices act as focal points for national health authorities and donors when disasters strike.
7	The World Health Organisation	WHO can provide technical co-operation aimed at assessing health needs. Managing health services and estimating the costs of assistance projects, WHO also promote the implementation and use of the SUMA system for humanitarian supply management.
8	The European Community	Providing food and other emergency assistance and

	Humanitarian Office (ECHO)	helping refugees and displaced populations, it also invests in projects aimed at disaster prevention in high-risk regions.
9	Caribbean Disaster Emergency Response Agency (CDERA)	Established by the Caribbean Community, based in Barbados, it has 16 member states. Its chief functions are co-ordinating the response to any disaster affecting member countries and contributing to disaster reduction.
10	The Coordination Centre for the Natural Disasters Prevention in Central America (CEPREDENAC)	Works with national scientific and operations agencies to build local capacity for vulnerability reduction. Its objective is to promote disaster reduction in Central America through the exchange of experiences, technology and information, the joint analysis of common strategic problems and channelling foreign co-operation.
11	Doctors of the World	Humanitarian medical NGO that intervenes in emergencies
12	CARE (Cooperative for Assistance and Relief Everywhere)	CARE runs projects in Latin America and provides emergency assistance to communities affected by disasters. It manages development and aid projects in 62 countries in Africa, Asia, Latin America and Eastern Europe.
13	World Vision International	Providing development aid, World Vision International is a Christian organisation that intervenes in aid activities during disasters.
14	Caritas International	An international confederation of 146 Roman Catholic agencies working in 194 countries and territories, it promotes, co-ordinates and supports emergency aid and long-term rehabilitation activities.
15	Action Against Hunger	Focuses on food security and distribution and supports projects to rehabilitate agriculture and

		food production.
16	Salvation Army	Intervenes in more than 100 countries, providing social, medical, educational and other types of community assistance. In disaster situations, national affiliates provide health assistance and emergency supplies.
17	World Council of Churches	Supports disaster relief efforts through its member churches in various countries.
18	Save the Children	Intervenes in long-term development projects and provides humanitarian supplies and rehabilitation and reconstruction assistance
19	Voluntary Organisations in Cooperation in Emergencies (VOICE)	A network of European non-governmental organisations that provide emergency rehabilitation assistance and contribute to disaster preparedness and conflict prevention.
20	The International Federation of Red Cross and Red Crescent Societies (IFRC)	Promotes fundamental principles and humanitarian values, disaster response, disaster preparedness, health and care in the community.

Source: Adapted by the author from PAHO/WHO 2001:42-44, February 2012

### **3.9 The role of container shipping lines and freight forwarding companies in handling relief materials**

The World Food Programme (WFP) distributed close to 3.2 million tons of food in 32 vessels in 2014 (World Food Program, 2014). This is predominantly done by the utilisation of container vessels. On any given day, the agency's ocean transportation service (OTS) will have 32 ships at sea, carrying critical foodstuffs for distribution in more than 92 countries worldwide (World Food Program, 2014). Having such a large number of vessels at sea at any one time allows the WFP to reroute cargo to areas where unexpected emergencies occur and relief materials are required (World Food Program, 2014).

With such high volume of shipment passing through the ports, container shipping lines and freight forwarding companies require an efficient port system. This may prove a challenge if the infrastructure from berthing to the yard and to the gate, does not meet the high volume of shipments



entering the ports. The competitiveness of Africa's economies will depend on the efficiency of the African Ports (AFDB, 2015).

The ocean transportation service arranges all ocean transport related to WFP shipments of food aid. In order to do this, it works with a selected group of shipbrokers and freight forwarders. This job requires detailed planning and co-ordination. Decisions on how to ship food and when to consolidate cargoes all affect the overall cost of an operation and have to be studied carefully (World Vision International, 2014). At the Port of Durban, where these shipments have to pass through especially if the destination is Zimbabwe, a lot of paper work has to be completed in order to enable the shipment to go through the supply chain with ease. One of the major challenges is that these relief shipments may not be disclosed at the port as such it is considered as normal containers. However, if and when it is disclosed, it may mean that the container shipment is given priority and it may result in congestion (Field Work, 2014).

Shipping lines and freight forwarding companies have a role to play in the transportation of relief materials in containers from the point of origin to where they are needed (the point of destination) (WVI, 2014). For the purpose of this section, the study focuses on the shipping lines and freight forwarding companies that handle container ships. Examples of shipping lines and freight forwarding companies are: A.P Moller-Maersk Group, Mediterranean Shipping Company (MSC), Compagnie Maritime d'Affretement and Compagnie Generale Maritime (CMA CGM), Evergreen Line, China Ocean Shipping (Group) Company (COSCO), Hapag-Lloyd Group, China Shipping Container Lines (CSCL), Hanjin and Nippon Yusen Kabushiki Kaisha (NYK).

### 3.10 Shipping process for a container shipping line

Information technology has simplified logistics management from one port to the other (Kia et al., 2000). This may be implemented online by assessing the Maersk Line website. Figure 3.4 shows the process of shipping a container load of relief materials. The process starts with the shipping company becoming aware of the intention to ship. The shipping company is provided with the relevant information on relief materials (origin and destination).



**Figure 3.4 Shipping process of a container shipping line**

Source: Developed by the author, March 2012

### 3.10.1 Rates

Once the locations have been established, it is possible to determine the cost of transportation. However, based on the importance and urgency of the relief materials there will be an opportunity for negotiations. In addition to the locations, the NGO will be asked to specify:

- type of commodity
- container size and type

### 3.10.2 Booking a container

A booking request allows the shipping company a chance to review its requirements against other factors such as vessel allocation and equipment availability.

The basic required elements in the booking request process are (Maersk, 2012):

- parties for the shipment, with the shipper and the contractual party (if a service contract number is provided) being mandatory
- type of commodity
- container size, type and quantity
- origin ('from') and destination ('to')

There are additional details which can be supplied to enhance the booking request, namely (fieldwork, 2011):

- Does the commodity require temperature control or is it specified as "dangerous"?
- At the origin, who will collect the container from the container yard or would the NGOs like the shipping company to deliver the container at their premises?
- At the destination, would the NGO like Maersk Line to deliver the container at their warehouse or will alternative transportation be arranged?

The NGO is expected to provide the relevant inland address and contact information.

### 3.10.3 Shipping instructions

These are a set of instructions that require the following information (Maersk, 2012):

- booking number
- commodity
- type of transport document (seaway bill or negotiable bill of lading)
- type and number of packages
- number of containers with size and container type for each
- parties involved and contact details (e-mail, phone, fax)

- container numbers
- gross weight of cargo for each container
- invoicing details
- place of receipt, discharge and delivery
- seal numbers

Once the shipping instructions are processed, the NGO will be issued with a draft copy for review, known as a verify copy. In the documentation section online the NGO will have the ability to view the verify copies and approve or amend them as necessary. If the verify copy meets the NGO's expectations, it can be approved and the final documents will be prepared and released according to instructions (Maersk, 2012).

#### **3.10.4 Tracking shipment**

Once the shipment is underway, the sender may wish to keep track of its progress. Using the container, booking or document number(s), the sender can easily monitor the progress of the shipments using the relevant online tracking application (Maersk, 2012).

#### **3.11 Freight forwarders**

A freight forwarder is an intermediary who acts on behalf of importers, exporters or other companies or persons, organising the safe, efficient and cost-effective transportation of goods. Taking into account the type of goods and the customers' delivery requirements, freight forwarders arrange the best means of transport, using the services of shipping lines, airlines and road and rail freight operators. In some cases, the freight forwarding company itself provides the service (Morrell, 2012).

Companies vary in size and type, from those operating on a national and international basis to smaller, more specialised firms, which deal with particular types of goods or operate within particular geographical areas.

#### **3.12 Conclusion**

The literature review examined the importance of the supply chain of relief materials thereby providing a better understanding of what it entails. Secondly, it identified the challenges from the port perspective that affects the supply chain of relief materials; finally, it examined the various stakeholders and their roles in the maritime industry.

The port is a stakeholder in the supply chain of relief materials. It is important for ports to improve the dwell time of containers that are laden with relief materials. The section initially focused on the ports, and then narrowed its research to container terminals in the ports. This is because the majority of relief materials are transported in containers (Bestenbreur, 2012).

The humanitarian organisation is another stakeholder. The section also investigated a selection of humanitarian organisations and the role they play in the event of disasters. The chapter went on to identify the relief materials that are required for each type of natural disaster.

The shipping company and the freight forwarders are also part of the supply chain. The section highlights the role that they play and the functions they perform.

## **CHAPTER 4: LITERATURE REVIEW AND PORT CHARACTERISTICS SPECIFIC TO AFRICA**

Asia has been the focus of research on disasters. This is not unusual as a significant amount of disasters have occurred in Asia (Kovacs and Spens, 2009). However, in Africa, there has also been a significant increase in the spate of natural disasters and conflicts. Africa is second only to Asia in terms of the occurrence of natural disasters”. Furthermore, according to Bhavani et al. (2008) “Sub-Saharan Africa is not the most disaster prone region; however, it is the most vulnerable to disasters, because of physical, social, economic and environmental factors that negatively affect the capacity of people to secure and protect their livelihoods. The major factors are poverty and low incomes, fragile and degraded environments, a high prevalence of diseases and low access to social services, weak governance and armed conflict”.

The focus of this literature review is on Sub-Saharan African ports. Firstly, an overview of the various types of ports is discussed. Secondly, it focuses on the peculiarities and capabilities of selected Sub-Saharan African ports; thirdly, it examines efficiency indicators for ports, fourthly, it determines the implication of delays on the supply chain of relief materials.

### **4.1 Ports in Africa**

Port terminals play an integral role in this logistics chain by providing cargo-handling services to a wide spectrum of customers, including shipping lines, freight forwarders and humanitarian organisations. This section examines the container ports with container terminals in Sub-Saharan Africa. Sub-Saharan Africa comprises countries that are situated south of the Sahara. Consequently, these countries exclude the seven countries of North Africa, namely Algeria, Egypt, Libya, Morocco, Sudan, Tunisia and Western Sahara. These are shown in Figure 4.1, where the North African region is indicated in purple and the Sub-Saharan region is indicated in white. For the purpose of this study, the research is limited to Sub-Saharan Africa. Ports with container terminals in North Africa are excluded, because they are usually grouped with the Middle East.



humanitarian assistance in terms of food, water, medicines and shelter to areas affected by disasters.

Ports in Africa are besieged by inefficiencies (African Development Bank, 2010). These inefficiencies become obvious in the high dwell time of cargo. Cargo spends more than 20 days in most of the ports in Africa (African Development Bank, 2010). Bottlenecks such as high dwell time impose high transaction costs, which affect the competitiveness of African economies, thereby lowering trade performance (African Development Bank, 2010).

Ports in Africa are lagging behind, compared to their Asian counterparts with regards to total transport time. This is evidenced by the time spent in ports, usually averaging 20% of total transport time, but in Africa the ratio increases to 80% (Notteboom, 2006). In 2004, approximately 146 days were lost on weekly service between Europe and Africa because of congestion. This resulted in a revenue loss estimated at \$5 million that was transferred to the shipping lines and freight forwarding companies through congestion charges (Palsson et al., 2007; African Development Bank, 2010).

Port performance is an essential element of the overall cost of trade (Batista, 2009). The African continent lacks natural ports, while its artificial seaports have been poorly developed (African Development Bank, 2010). In spite of this, the amount of cargo transiting through Africa's ports has trebled, even though containerisation is low and inland transportation linkages remain weak (World Bank, 2009a). From the foregoing, one can deduce that it is important for ports in Africa to be efficient to be able to expedite the flow of relief materials.

## 4.2 Types of ports in Africa

This section describes the various types of ports that are available in Africa. These ports are categorised and each section gives various African examples. Table 4.1 shows the types of ports in Africa.

**Table 4.1: Types of ports in Africa**

S/N	TYPES OF PORTS	FEATURES
1	General cargo ports	These are medium-sized ports (including container terminals) with a large enough volume to attract frequent direct vessel calls. Volumes are typically between 2 and 10 million tonnes per annum and 100 000 - 500 000 TEUs per annum. Examples of general cargo ports include Port Elizabeth in South Africa and Walvis Bay in Namibia.
2	Hub ports	These are large global or regional ports with high volumes of direct large vessel calls. They service a large catchment area which also serves the smaller regional ports by transshipping containers and general cargo in

		smaller vessels. Examples of hub ports are Durban in South Africa and Port Said in Egypt. The main transshipment points for regional traffic are Abidjan, Côte d'Ivoire; Dar es Salaam, Tanzania; Djibouti; Mombasa, Kenya (Mundy and Gwilliam, 2010)
3	Feeder ports	These are normally small ports with limited vessel calls and depth restrictions. They are unable to attract many direct vessel calls because of the small volumes of trade they handle. They handle less than 100 000 TEUs per annum. These ports are mostly fed by smaller coastal services from regional hub ports. Examples of these types of ports are the Nigerian ports, Angolan ports and Mozambican ports. The feeder service and the double handling of containers add to the overall logistics costs.
4	Bulk ports	These are ports that are dedicated to the handling of large volumes of bulk materials, accommodating capsize vessels with depths of 18-25m, generally without dedicated container terminals. Examples of these types of ports are Richard's Bay (coal) and Saldanha Bay (iron ore) in South Africa and Port Saco in Angola and Buchanan in Liberia, both handling iron ore.
5	Transshipment terminals or ports	These are large container terminals where cargo is transferred from one ore carrier to another or from one type of vessels to another. Examples of transshipment terminals include the Ports of Algiers, Durban, Mombasa and Djibouti. These transshipment terminals handle very large container vessels (above 6 000 TEUs) which very few African ports can handle. Vessels of more than 15 000 TEUs require a depth of 16-18 m. The new port of Ngqura in South Africa, with a depth of 16 m, has been developed as a transshipment port and will receive large vessels from the east and tranship to smaller vessels for the East African and West African coasts.
6	Dedicated oil terminals	These handle crude oil, which is most often transported in large capsize vessels of 120 000 to 150 000 dwt that require greater water depths that can be provided at any of the African ports currently. Oil tankers are mostly handled at offshore moorings which are linked to landside storage tanks via submarine pipelines. This is the case for the Ports of Durban in South Africa, Dar es Salaam in Tanzania and Cabinda in Angola. Some ports such as the Port of Cape Town in South Africa have dedicated tanker basins.
7	River ports	These are generally small and isolated and do not serve oceangoing vessels. One notable exception is Matadi Port in the Democratic Republic



		of Congo (DRC), which is 150 km from the coast and serves as the country's main port, but with restricted depth.
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Source: Adapted by the author, the content comes from the African Development Report, 2010:38

### 4.3 Selected Sub-Saharan African ports

This section examines some selected Sub-Saharan African ports and discusses the facilities that are available in these ports. The African ports are characterised by the presence of a large number of container terminals, each having a capacity of less than 1 million TEUs (ADR, 2010:40). Below is an overview of the main ports in Africa in terms of their infrastructure, facilities and capacity. The ports that are examined are divided into six sub-regions, according to their location in Africa. The study only focuses on a single port per region (ADR, 2010:55).

- East Africa: Djibouti, Eritrea, Kenya, Somalia, Sudan, and Tanzania
- Southern Africa: South Africa, Angola, Mozambique, Namibia
- Central Africa: The Republic of Congo, Equatorial Guinea, Gabon, Cameroon
- West Africa: Benin, Cote d'Ivoire, The Gambia, Ghana, Liberia, Nigeria, Senegal, Sierra Leone and Togo

#### 4.3.1 Port in East Africa

In the East Africa sub region, the Port of Sudan is the largest port in terms of total area, while Djibouti is the largest in terms of storage capacity. Kenya has the busiest port (Mombasa) in the sub region, which provides the major export gateway to landlocked countries (ADR, 2010:60). According to ADR (2010:60), "the Djibouti terminal offers the most modern facilities, but needs more investment to meet the high transit demand from Ethiopia".

##### Port of Mombasa

The Port of Mombasa is a critical gateway for Central Africa's landlocked countries and developments in the port are, therefore, of great significance (World Bank AICD, 2009). The Port of Mombasa is the busiest port in East Africa. It serves countries such as Uganda, Rwanda, Burundi, South Sudan and the eastern gateway of the Democratic Republic of Congo (ADR, 2010: 60). The port handles containers, general cargo, dry bulk and liquid bulk. In 2011, the port handled 19,6 million tonnes of cargo, of which 14 million tonnes were imports and 5 million tonnes were transited to neighbouring countries (Kenya Port Authority, 2012-2013).

According to the African Development Report (2010:60),

"the container terminal has a storage capacity of 7,272 TEUs and benefits from a rail link to the city of Mombasa. The port is affected by congestion, which is as a result of heavy

throughput traffic. The terminal performance is constrained by its small storage capacity and depth, which limits the size of the vessels using the port. The available equipment cannot load and unload cargo fast enough to avoid congestion. Lack of modern advanced handling equipment such as super and post-Panamax ship-to-shore gantry cranes has also led to congestion and delays”.

Two major challenges experienced by the Port in Mombasa are poor hinterland connectivity due to substandard and unreliable rail services, poor road infrastructure and missing links (ADR, 2010:60). Other challenges include; rapid increase in traffic; high container dwell time; inefficient hinterland rail connections; long documentation procedures; and inadequate capacity to handle forecasted cargo volumes (Ntibarekerwa, 2008).

### **Port costs and performance**

Port users pay a price for the inefficiencies that are inherent at the Port of Mombasa. The charges incurred by importers and exporters in recent years have been inflated due to the application of once-off charges, such as congestion surcharges applied by shipping lines (World Bank AICD, 2009). Ports in Eastern and Southern Africa experience the following challenges; namely insufficient container storage, long container dwell time; rapid increase in container traffic, low performance of inland modes of transport especially the rail, infrastructure, IT systems, safety, security and environmental issues (Ntibarekerwa, 2008).

### **4.3.2 Ports in Southern Africa**

The Southern Africa sub region includes Angola, Mozambique, Namibia and South Africa. South Africa has the largest and most developed ports. Durban is the second busiest port on the continent (ADR, 2010:60).

#### **Port of Durban**

The Port of Durban has a total land and water area amounting to 1 854 hectares. The port is protected by the northern and southern breakwaters, which are 335 m and 700 m long respectively. The port has 57 berths and over 4 000 commercial vessels calling there each year (ADR, 2010:65). The Port of Durban is South Africa’s general cargo and container port. It is the second busiest port in Africa and is strategically placed on world shipping routes (ADR, 2010:62).

#### **Facilities**

The Durban container terminal storage capacity of 14 500 TEUs has state-of-the-art handling equipment with super post-Panamax and post-Panamax ship-to-shore container equipment. The widening and deepening of the port entrance and channels enabled much larger and later generation ships to use the port facilities. The Port of Durban is South Africa’s premier container port handling

65% of South Africa's container traffic (Transnet National Ports Authority, 2014). The port handles over 4700 commercial vessels annually, equating to over 74 million tons of cargo per year (Transnet National Ports Authority, 2014).

Challenges that affect the Transnet National Ports Authority (TNPA), include the growth in the global economic traffic; lack of intermodal harmonization to improve the regional supply chain and reduce logistics costs (Transnet National Ports Authority, 2014; Ntibarekerwa, 2008).

### **4.3.3 Ports in Central Africa**

West and Central Africa maritime transport and port sectors face several long term trends such as: the link between the ports and the hinterland, ship size (containerships), unstable tariffs and port infrastructure (Fouda, 2012). In the Central African sub-region, the Port of Cameroon is the most developed.

#### **The Port of Cameroon (Douala)**

This sub-region has the least developed ports in Africa (ADR, 2010:68). Of these, the Port of Douala in Cameroon is the most developed. Douala is the largest port in Cameroon and it services the surrounding landlocked countries of the Central African Republic and Chad. According to the ADR (2010:68), "the Port of Cameroon handles over 95% of the commercial traffic and has a storage capacity of 13,000 TEUs". The port has a fairly shallow draft. This restricts the size of vessels that call on the port. The terminal is connected to the Cameroon railway. Even though Douala has emerged as one of the most efficient ports on the west coast of Africa, it has limited capacity (ADR, 2010:68).

### **4.3.4 Ports in West Africa**

In the West Africa sub region there are numerous ports, but there is no connection from the sea to the hinterland. Some of the ports in this region, like the one in Abidjan, are recovering from loss of business due to internal conflict (ADR, 2010:69). Sierra Leone and Liberia have also come out of conflict situations and their ports are in need of rehabilitation. According to the Port Management Association of West and Central Africa, infrastructure deficit continues to hamper port performance and port efficiency in this region (ADR, 2010:69). This is mainly due to a lack of concrete programmes for the transport sector, leading to lower prioritisation of resources to the ports subsector (ADR, 2010:69).

#### **Port of Tema**

This is Ghana's busiest seaport. It handles transhipped and transit cargo goods destined for the hinterland and landlocked countries of Burkina Faso, Mali and Niger (ADR, 2010:72). Tema is the larger of the two sea ports located in Ghana (Ghana Ports and Harbours Authority, 2006). According

to (ADR 2010:72) “Tema has encountered substantial congestion problems that may continue over the short term. The port has a storage capacity of 5,000 TEUs. The port lacks modern handling equipment suitable for large vessels to facilitate faster turnarounds. The port does not have rail facilities”.

### **Port costs and performance**

Shipping lines face congestion costs and poor port productivity in West and Central Africa (Fouda, 2012). Furthermore, shipping lines face increased costs in West and Central Africa, because of poor port efficiency, low traffic and inadequate/insufficient port equipment (Fouda, 2012).

## **4.4 Brief profile of each container terminal**

The profile of each container terminal and port creates awareness on the capabilities of the terminals. This section examines the ports regionally. Two ports were examined from each region, with the exception of Southern Africa, where three ports were examined. The ports are:

### **4.4.1 Southern Africa**

- **Port of Durban and Port of Cape Town Container Terminals**

Transnet National Ports Authority provides port infrastructure and marine services at the eight commercial seaports along the 2 954 km-long South African coast line. Transnet Port Terminals operates (TPT) four container terminals in South Africa; these are located at Durban, Ngqura, Port Elizabeth and Cape Town. Transnet’s ports provide a regional gateway and a reliable and efficient interface for imports and exports within the Southern Africa Development Community and other Sub-Saharan African countries. However, for the purpose of this study, only the Port of Cape Town and the Port of Durban container terminals are examined. The Port of Durban has two container terminals, known as the Durban Piers 1 and 2 respectively, and the Port of Cape Town has only one container terminal, the Ben Schoeman terminal. These three container terminals have the capacity to service 4.5 million TEUs per annum (see Table 4.2). The Cape Town container terminal is serviced by Post-Panamax and Super Post-Panamax gantry cranes designed for larger vessels. Transnet Port Terminals (TPT) has invested billions in upgrading this sector. All these container terminals use the NAVIS system, which provides integrated real time shipping information (Transnet, 2013). The container terminals have state-of-the-art cargo- handling equipment (ship-to-shore cranes, straddle carriers, rubber-tyred gantries, tipplers, conveyors) and manage the logistics interface with inbound and outbound rail and trucking carriers. The Port of Durban has 46 berths providing 10,933m of berth length in total. Eight berths make up the container terminal, which currently has a total capacity of 3.6 million TEUS per year (Pier 1 and 2) (Transnet, 2016).

**Table 4.2: Container terminal capacity**

S/N	CONTAINER TERMINAL	ANNUAL CAPACITY
1	Durban (Pier 1)	600,000 TEUs
2	Durban (Pier 2)	3.0 million TEUs
3	Cape Town	900,000 TEUs

Source: Transnet, 2015.

- **Port of Walvis Bay Container Terminal**

The Walvis Bay container terminal is managed by Namport, which is the National Ports Authority for Namibia. According to the Namibia Port Walvis Bay Corridor (2013) “the Port of Walvis Bay container terminal can accommodate 250 000 containers per annum. The average turnaround time is approximately 12 to 15 hours. Furthermore, containers secure a guaranteed three-day clearance period. The services include loading and unloading, stacking and de-stacking containers, reefer connections and monitoring, and the conveyance of the containers between the stack and the vessel”. The Walvis Bay Corridor Group further emphasises the importance of the ports by stating that “the Port of Walvis Bay provides a regional gateway and a reliable and efficient interface for imports and exports within the Southern Africa Development Community, and other Sub-Saharan African countries”. The container terminal can take ground slots for 3 875 containers, making provision for 424 reefer container plug points (Namibia Port Walvis Bay Corridor, 2013). The Port of Walvis Bay is currently operating at full capacity, as a result of which the container terminal handling capacity is being expanded. At the Port of Walvis Bay, the following equipment is available from Namport and through the local agents: reach stackers, forklifts, tractors, haulers, trailers, a harbour tower crane, as well as additional equipment including mobile cranes and haulage transport. The Port of Walvis Bay makes use of the Navis and SAP systems.

#### **4.4.2 East Africa**

- **Port of Mombasa Container Terminal**

The Kenyan Ports Authority (KPA) is responsible for managing the Port of Mombasa container terminal. In addition to serving Kenya, the port serves countries in inland Africa, such as Uganda, Tanzania, the Democratic Republic of the Congo, South Sudan, Rwanda, Sudan, Ethiopia, and Somalia. Inland transportation is provided by road and rail, and special railtainer services operate from the port to inland container depots (WPS, 2013).

According to Ports & Ships (2016), “the Port of Mombasa also has six container berths”. The growth of containers has continued with the Port of Mombasa handling 894,000 TEUs in 2013 and

1,01 million TEUS in 2014 (Ports & Ships, 2016). Containerized cargo represents about 70% of the Port of Mombasa's total cargo volume, and that volume is growing at around 12% per year (WPS, 2013).

The WPS (2013) also states that “the Container Terminal in Mombasa covers 137 thousand square meters, and the Mombasa Container Freight Station covers 39.8 thousand square meters. The Container Terminal in Nairobi offers 150.4 thousand square meters, while the Container Terminal in Kisumu adds another 18 thousand square meters to the container stacking space. Stacking yards around the port cover a total of 91.5 thousand square meters”. This container terminal is equipped with ship-to-shore gantry cranes. The existing facility has reached its maximum capacity, and there is need for expansion (WPS, 2013). The Port of Mombasa is in the process of acquiring a second container terminal that will be ready by 2019 (Ports & Ships, 2016).

- **Port of Dar es Salaam – Tanzania International Container Terminal**

Tanzania International Container Terminal (TICT), a privately operated container terminal, is located in the Port of Dar es Salaam in Tanzania. The TICT is a member of the Hutchison Whampoa Company. Tanzania International Container Terminal Services Ltd (TICTS) serves countries in East, Central and Southern Africa. According to the TICTS (2013), the terminal has “four berths on a continuous 725 metre quay with a 12.2 m depth alongside. A 140-metre-wide channel with a depth of 10.7 metres provides access from the open sea. The quayside is equipped with five ship-to-shore gantry cranes (SSGs), each with a capacity of 45 metric tonnes. The quay is able to accommodate three vessels at any one time at Berths 8, 9, 10 and 11”. In addition, TICTS has a 18.75 hectare container stacking area, paved with concrete blocks and designed to hold 11 500 TEUs for an annual capacity of 500 000 TEUs. The blocks are served by 12 rubber-tyred gantry cranes (RTGCs) and other yard handling equipment. There are 92 reefer plug points for refrigerated containers.

TICT owns and operates two ICDs directly linked to the container terminal in Tanzania by road and rail. They are in Kurasin and Ubugo. The terminal has undergone major changes that include the installation of a new sophisticated terminal software operating system known as the Next Generation Terminal Management System (NGEN).

#### **4.4.3 West Africa**

- **Port of Tema Container Terminal**

Ghana Ports and Harbours Authority is the National Port Authority of Ghana. Bolloré Africa Logistics was awarded the 20-year concession for the Meridian Port Services- MPS container terminal at the Port of Tema in Ghana. The container terminal handles cargo in transshipment to and from neighbouring countries, especially Burkina Faso and Mali.

The Port of Tema Container Terminal consists of two berths that are dedicated to handling container vessels. The terminal has the following equipment: ship-to-shore gantries, mobile harbour cranes, rubber-tyred gantries and reach stackers. The terminal annually handles 660 000 TEUs (Bolloré, 2013). The terminal operating system used is the Navis SPARC.

- **Tema Maranatha Freight Logistics Company**

This is an autonomous terminal that is privately and independently managed (Fieldwork, 2013). It is located in the Port of Tema in Ghana.

#### 4.5 Quantity, types and special process of handling relief materials

This section focuses on the quantity and types of relief materials shipped through the ports. The quantity of relief materials determines the importance that the port will place on such cargo. This section captures the quantity of relief materials per annum and the process by which the port handles such relief materials. Table 4.3 shows the regional display of types of relief materials and methods of handling such materials.

**Table 4.3: Relief materials: quantity, types and process**

Port	Quantities in a Year as number of TEUs	Type of Relief Materials	Special ways of Handling Relief Materials
<b>Southern Africa</b>			
Cape Town	1 000-5 000	Food	Cargo documents cleared expeditiously. Emergency containers not held in the holding area.
Durban	1 000-5 000	Food	None
Walvis Bay	Less than 1 000	Food	Notification received through the Ministry of Works and Transportation before the vessels arrive at the port. The responsible government agency or appointed clearing and forwarding agent will, upon receipt of the bill of lading, pass a landing order and obtain customs and shipping line clearance. This clearance should take less than 24 hours in order to ensure that the containers are released from the port on the same day.

<b>East Africa</b>			
Tanzania International Container Terminal	Less than 1 000	Food	Cleared by the World Food Programme or other agents appointed by the WFP.
Port of Mombasa	More than 10 000	Food  Blankets and mosquito nets  Cooking sets and household items  Shelter kits  Construction materials and tools  Medicines  Clean water kits  Agriculture/livestock	Containers are stacked in a designated area for ease of delivery.
Port of Tema	1 000-5 000		Clearance of emergency relief cargo undergoes similar checks as normal cargo, also depending on the volume. Dedicated exit gates may be created for emergency relief situations; otherwise the emergency relief cargo goes through the same process as normal goods.
Tema Maranatha	1 000-5 000	Blankets and mosquito nets  Medicines	Go through customs clearance under automatic exemption from the government.

Source: Author, Field work May 2013

#### 4.6 Port infrastructure

Port infrastructure indicates the facilities that are available at the container terminals for the port and terminal users. This section examines the type of infrastructure that the various ports have in order to assist in their primary function of vessel handling. The infrastructure includes cargo handling equipment, trucks, etc. In the Port of Tema, the trucks are outsourced to private



companies. In addition to the equipment listed, the Port of Mombasa also has terminal tractors and heavy-lift cargo handling gears. Table 4.4 shows the infrastructure at each port in each region. Southern Africa, particularly Pier I in the Port of Durban, has up to 90 trucks at its disposal for moving containers to the stacking areas (Field Work, 2011).

**Table 4.4: Types of equipment**

Port	Reach Stacker	Gantry Crane	Spreader	Rail- Mounted Gantry	Rubber- Tyred Gantry	Straddle Carrier	Top Lifter	Number Of Trucks
<b>Southern Africa</b>								
Cape Town	X	X	X	X	X	X		70
Durban	X	X	X	X	X	X		90
Walvis Bay	X		X	X	X			11-50
<b>East Africa</b>								
Mombasa	X	X	X	X	X		X	More than 50
TICTS	X	X		X	X			11-50
<b>West Africa</b>								
Tema	X	X	X		X		X	Outsourced to private companies
Maranatha		X						None

Source: Author, Field work May 2013

## 4.7 Problems

Problems are impediments to the flow of the supply chain of relief materials (Field work, 2013). These problems serve as a bottleneck to the efficient service delivery of the port. In handling large volumes of containers with relief materials, the ports encounter various problems. Some of the problems are itemised regionally and some of the problems, such as port congestion, occur in all of the ports. These problems are highlighted below:

### 4.7.1 Port problems in Southern Africa (Field work, 2013)

- limitation of available land space, e.g. for stacking and handling of containers

- wind affecting the cargo-handling equipment
- wind damaging containers
- port congestion, especially at the quayside, with vessels competing to berth

#### **4.7.2 Port problems in East Africa (Field work, 2013)**

- the sequence of discharge due to different stowage positions on board the importing vessel
- late documentation once a container has landed
- the issue of availability of a truck to remove containers on time, hence increase in dwell time
- bunching of ships (when several ships arrive at almost the same time)
- strain on limited resources
- port congestion, which at times may lead to the imposition of vessel delay surcharge.

#### **4.7.3 Port problems in West Africa (Field work, 2013)**

- workers needing to work overnight in order to create space at the port
- scarcity of manpower
- not enough trucks within the port
- port congestion

### **4.8 Proactive measures**

This section examines what port authorities can do to solve the problems identified in section 4.7. The port authorities have the advantage of being able to solve the problems even before they occur. In section 4.7, the various problems such as port congestion or wind, amongst others, at the ports, are identified. As a result, the port authorities have devised measures to combat these problems. This section shows various proactive measures available. The proactive measures that the ports intend to embark on in order to expedite their service delivery are shown in Table 4.5.

**Table 4.5: Proactive measures at ports**

REGION	PROACTIVE MEASURES
<b>Southern Africa</b>	Purchasing of wind resistant Rubber Tyred Gantries operating up to a wind speed of 90 km/h  Sourcing space for temporary storage from local authorities and private individuals.  Deepening and dredging of the port quayside  Strengthening of the quay walls  Increasing productivity via training of personnel
<b>West Africa</b>	Forming ad hoc committees to handle emergencies  Informing workers prior to the time that they will need to work overnight and also on public holidays if necessary
<b>East Africa</b>	Off-dock facilities at private freight stations  Containers must be cleared from the port within 48 hours of discharge.  Minimum documentation procedure is involved  A special gate is designated for this kind of operation.

Source: Author, Field work, May 2013

#### 4.9 Efficiency indicators for ports in Africa

Many parameters have been used to measure the different factors contributing to port performance. Various factors are taken into account when producing these efficiency indices, namely physical infrastructure, management and services, governance, regulations, customs and institutional framework.

According to Fourgeaud (2000), “it is not possible to determine benchmarks that would be used for all ports”. He stated further that all expressions of port performance do not address the same requirements. Therefore, carefully identifying problems to be monitored and taking into account the main characteristics of the commercial activity should lead to more accurate indicators and targets.

There are two specific indicators to be used:

- turnaround time
- dwell time

### **4.9.1 Turnaround time**

According to ADR (2010:45) “the primary measures of port performance are the average turnaround time per ship and the tonnage handled per ship in the port. The ship turnaround is the rate at which cargo is handled and the duration that cargo stays in the port prior to shipment or port discharge. It is calculated from the time of the ships’ arrival to the time of their departure. Turnaround time can be expressed in terms of the number of days or hours”.

The average turnaround time per ship is determined by the total number of ships calling at the port divided by the total number of hours. In compiling data to determine ship turnaround time or tonnage handled per ship-day (or ship-hour), a port would normally split the total time in port into ‘time at berth’ and ‘time off berth’. Within each of these service activities, the amount of delay (idle time) would be recorded as well as the reason for the delay. Importantly, the ratio between waiting time for berth and time spent at berth is known as the waiting rate. This is a significant indicator of possible congestion status (ADR, 2010:45; Le-Griffin & Murphy, 2006).

### **4.9.2 Dwell time**

Dwell time in international trade indicates the actual time a consignment stays at the port of entry commencing from the time the transport has discharged the cargo until it exits from the port premises having completed all relevant formalities (USAID, 2014). Dwell time is defined as the duration for which an entity stays in the port for service (India Inter Ministerial Group, 2007).

According to ADR (2010:46) “the perspective of the importer or exporter is an important determinant for port performance. This is because the importer/exporter focuses primarily on dwell time of cargo in the port. This is measured in the number of days that the tonnage of cargo remains in the port. A high dwell time is an indication that there are problems in the port”.

Another measure of assessing container terminal performance is the cycle times of trucks dropping off and picking up containers in the terminal (World Bank AICD, 2009). According to World Bank AICD (2009) an efficient truck cycle time is less than one hour, but in West Africa it can exceed ten hours. Southern Africa, at four hours, boasts relatively better average truck cycles. World Bank AICD (2009) also emphasises that possible improvements to cycle time include “the efficient management of terminals, use of pre-booking and information technology management systems, and better port access infrastructure”.

#### **4.9.2.1 Cargo/Container Dwell Time**

This can be defined as the time cargo or container remains in a terminal’s in-transit storage area while awaiting shipment by vessels in exports or evacuation by rail or road in imports (India Inter Ministerial Group, 2007).

#### **4.9.2.2 Vessel Related Dwell Time**

This is defined ‘as the time a vessel reports at anchorage to the time it is cast-off from the berth (India Inter Ministerial Group, 2007).

### **4.10 The Implication of delays on the Supply Chain of Relief Materials**

In order for the logistics chain to operate efficiently and at the lowest cost, the whole chain must act at the same speed, the links in the chain must act as equal partners, and the management of the chain must become closely integrated (Choi et al., 2010). The implication of this is that interruption in the supply chain will increase the risk of waste in the form of damage or pilferage (Taylor and Pettit, 2009). The implication of delays on the supply chain is that it will cause an increase in the costs. Procedures at the ports such as lengthy clearance time raise the inventory and financing costs (Carballo et al., 2014). The increase in the costs can be 30% higher for firms (Carballo et al., 2014). The significant implication of delays to the supply chain of relief materials is that it can affect its success or its failure. Prolonged delays can actually spoil or damage the consignments, if adequate arrangement is not made for its storage. For example, in 1984 at the Port of Assab in Ethiopia, unexpected rain spoiled 10 000mt of grain due to the inexperience of the port authorities. Furthermore, the food management personnel did not take the necessary measures to save this commodity after the rain (Jansson et al, 1987).

### **4.11 The way forward**

Global transportation involves the movement of goods from one country to the other making use of various modes of transport (Coyle et al., 2011) One of the major challenges in global transportation is maintaining and controlling freight as it moves across border and is handled between carriers and intermediaries (Coyle et al., 2011). Timely information sharing and the use of technology can vastly improve ship visibility. Proper freight documentation ensures compliance with government regulations and facilitates the uninterrupted flow of goods through potential bottlenecks at border crossing and ports (Coyle et al., 2011). Paperwork may seem like a simple issue in this era of information technology, but there are still communication channel challenges. This is because much larger documents are involved in global transaction, therefore the country of export, country of import; transportation companies, banks and importers all require varying documents (Coyle et al., 2011). Freight documentation controls the cargo on its journey from origin point in the country of export to its final destination in the country of import (Coyle et al, 2011:71). Missing or incorrect paper work can cause delays and additional costs. A failure to provide complete cargo information 24 hours prior to loading at an international seaport can lead to denial of loading, fines and penalties. Paperwork errors can lead to custom clearance delays, additional inspection and improper application

of duty rates. Hence, proper and accurate documentation is critical to the timely and cost efficient flow of international cargo (Coyle, et al, 2011:71).

#### **4.12 Conclusion**

This chapter examined the inefficiencies at Sub-Saharan African ports. Secondly, it identified selected ports in Africa; and the challenges that affect the supply chain; thirdly, it focused on efficiency indicators, fourthly it defined the types of cargo dwell time and finally, it determined the implication of the delays on the supply chain of relief materials.

## **CHAPTER 5: RESULTS OF RESEARCH**

### **5.1 Introduction**

This chapter focuses on the results achieved from the field work. The results were obtained from the research tools such as questionnaires; electronic surveys; in-depth interviews and telephonic interviews. Each unit of analysis was analysed based on selected variables that are critical to designing the guideline. The responses received from the units of analyses formed the basis for designing the guideline.

This chapter focuses on the stakeholders in the supply chain of relief materials. The stakeholders that are analysed are:

- humanitarian organisations
- shipping lines and freight forwarding companies
- container ports/terminals

### **5.2 Humanitarian organisations**

Humanitarian organisations are established to help and assist in cases of natural disasters and situations of conflict. Natural disasters and conflicts afflict humanity, and as a result, humanitarian organisations are there to provide relief. In Africa, the impact of natural disasters and conflict is further aggravated because of poverty, disease and other spatial issues (Boko et al., 2007). Frequently, the host country does not have the resources to handle the consequences of the disaster. There is a need for external intervention and help. International humanitarian organisations provide help by sending relief materials such as food, clothing and medical supplies to African countries affected by natural disasters and conflict.

A questionnaire was designed for the purpose of the study, which was distributed electronically, and obtained responses from six humanitarian organisations. The responses are discussed in this section under the following subsections:

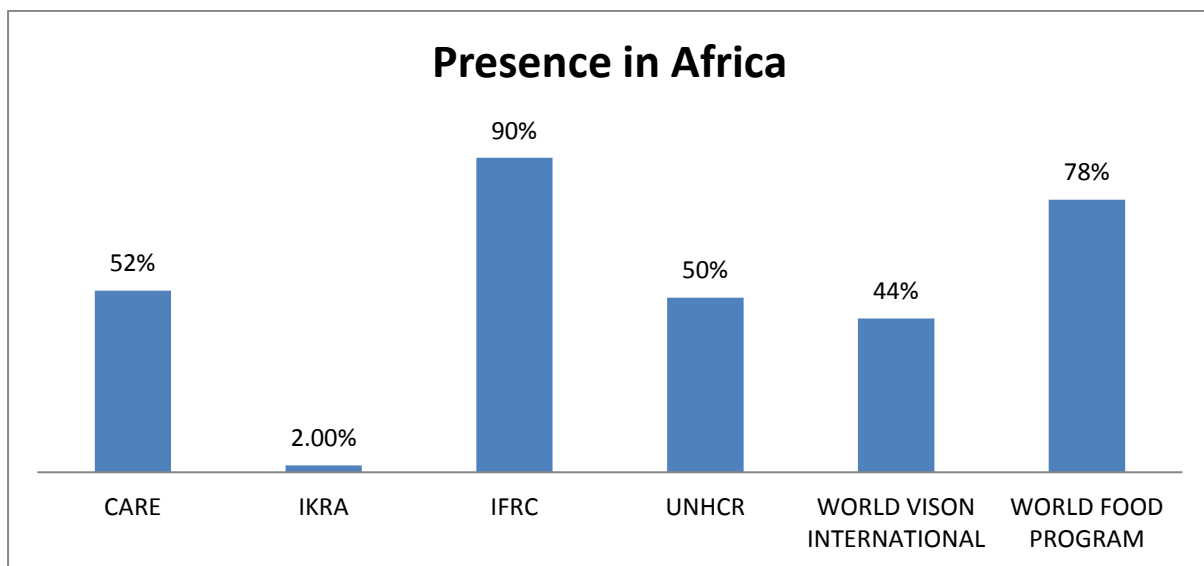
- Presence in Africa
- Types of relief materials sent per region
- Process of sending relief materials
- Problems encountered at the various ports in sending relief materials
- Need for a guideline
- Consideration for other modes of transport
- Conclusion

### 5.3 Presence in Africa

The humanitarian organisations examined have notable footprints in Africa. This enables them to act proactively when emergency situations occur in the countries in which they are domiciled. There are 54 nations in Africa. The research examined the presence of the following humanitarian organisations in Africa:

- CARE
- IKRA Educational Training Centre - IETC
- International Federation of Red Cross and Red Crescent Societies.
- United Nations High Commission for Refugees
- United Nations World Food Programme
- World Vision International

The extent of coverage by these organisations is shown in Figure 5.1. The International Federation of Red Cross and Red Crescent Societies have the highest percentage, viz. 90%, and the United Nations World Food Programme has the second highest, viz. 78%. The presence of these organisations is explained further in Figure 5.2.



**Figure 5.1 Presence of humanitarian organisations in Africa**

Source: Author, March 2013





**Figure 5.2 Distribution of humanitarian organisations in Africa**

Source: Adapted by author from SDV-Bollore, March 2013

#### **5.4 Types of relief materials sent regionally**

Based on findings, humanitarian organisations send relief materials to their beneficiaries in order to alleviate their suffering. This section deals with relief materials and provides a better understanding of what relief materials are and the various types. In the questionnaire, the respondents were asked to tick the various types of relief materials they send to countries in Africa affected by natural disasters or conflict. The types of relief materials vary according to region and also according to the type of conflict or natural disaster concerned. However, there are some relief materials that are sent irrespective of the disasters or the region affected. These types of relief materials are categorized as

‘essentials’ and comprise of food, medicines and clean water kits. The other types of relief materials depend on the type of emergency and the region. These are known as ‘varying’ relief materials.

The relief materials were categorised as follows:

### **Essentials**

- food
- medicines
- clean water kits

### **Varying**

- blankets and mosquito nets
- cooking sets and household items
- shelter kits: tents and tarpaulins
- construction materials and tools
- agriculture and livestock
- hazardous goods
- information technology gadgets
- security items: bullet-proof vests
- books, toys, bicycles and shoes

Relief materials are crucial not only to the survival of victims of natural disasters and conflict, but also to the development of the country affected by the calamity. It is hoped that the timely receipt of these relief materials may rebuild and rehabilitate (Tomasini and Van Wassenhove, 2009b). This means that homes or any other infrastructure that have been shattered due to flood and any other natural disaster needs to be rebuilt. Individuals that have suffered lack of food, water, shelter will be rehabilitated or restored. The relief materials can help to rebuild or rehabilitate.

Table 5.1 shows the various types of relief materials sent through the various ports to the regions affected. It shows the differences in relief materials sent regionally. For example, regions that have the *Anopheles* mosquito require mosquito nets. Mosquitoes are predominant in West Africa as well as in East Africa. Food is an essential relief material. The World Food Programme is a leader amongst humanitarian organisations in sending food. Table 5.1 also shows other ports in the region to which the humanitarian organisations send relief materials that were not included in the questionnaire. This emphasises the extent of coverage in the region

**Table 5.1 Types of Relief Material****Region: Southern Africa**

	CARE relief materials	IKRA relief materials	IFRCRC relief materials	UNHCR relief materials	UN WFP relief materials	WVI relief materials
Port of Durban	Food	N/A	N/A	Shelter kits: Tents and Tarpaulins	Food Shelter kits: tents and tarpaulins Vehicles	Food Blankets and mosquito nets Cooking sets and household items Medicines Shelter kits: tents and tarpaulins Vehicles
Port of Cape Town	Shelter kits: tents and tarpaulins	N/A	N/A	N/A	N/A	N/A
Port of Maputo	Food	N/A	Blankets and mosquito nets Cooking sets and household items Shelter kits: tents and tarpaulins Vehicles	N/A	Food  Shelter kits: tents and tarpaulins Vehicles	Food Blankets and mosquito nets Cooking sets and household items Medicines Shelter kits: tents and tarpaulins Vehicles
Port of Beira	N/A	N/A	Blankets and mosquito nets Cooking sets and household items Shelter kits: tents and tarpaulins Vehicles	N/A	Food Blankets and mosquito nets Cooking sets and household items Shelter kits: tents and tarpaulins Vehicles	Food Blankets and mosquito nets Cooking sets and household items Medicines Shelter kits: tents and tarpaulins Vehicles

**Region: East Africa**

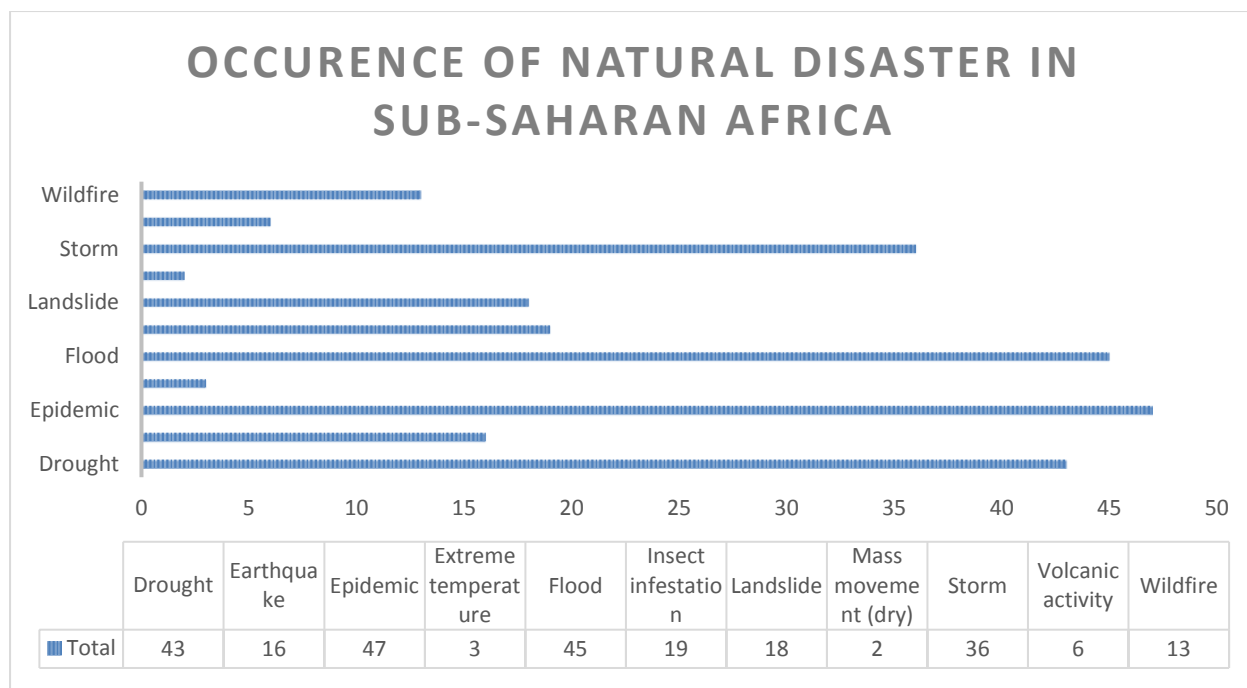
Port of Dar es Salaam	Food Blankets and mosquito nets Shelter kits: tents and tarpaulins	Food Blankets and mosquito nets Shelter kits: tents and tarpaulins Cooking sets and household items Construction materials and tools Medicines	N/A	Blankets and mosquito nets Cooking sets and Household items Shelter kits: tents and tarpaulins	Food Shelter kits: tents and tarpaulins Vehicles	Food Blankets and mosquito nets Cooking sets and household items Shelter kits: tents and tarpaulins Medicines
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		Vehicles Clean water kits Agriculture and livestock Information technology - radio Phones Books, toys and shoes				
Port of Djibouti	Food Blankets and mosquito nets Shelter kits: tents and tarpaulins	N/A	N/A	Blankets and mosquito nets Cooking sets and household items Shelter kits: tents and tarpaulins Vehicles	Food Cooking sets and household items Shelter kits: tents and tarpaulins Vehicles	N/A
Port of Mombasa	Food Blankets and mosquito nets Shelter kits: tents and tarpaulins	Food Blankets and mosquito nets Shelter kits: tents and tarpaulins Cooking sets and household items Construction materials and tools Medicines Vehicles Clean water kits Agriculture and livestock Information technology - radio Phones Books, toys and shoes	N/A	Blankets and mosquito nets Cooking sets and household items Shelter kits: tents and tarpaulins Construction materials and tools Vehicles Radios Phones Bullet-proof vests	Food Cooking sets and household items Vehicles Shelter kits: tents and tarpaulins	Food Blankets and mosquito nets Cooking sets and household items Shelter kits: tents and tarpaulins Medicines
Port of Sudan	Food Blankets and mosquito nets	N/A	N/A	N/A	N/A	N/A
Port of Toamasina	Food Blankets and mosquito nets Shelter kits: tents and tarpaulins	N/A	N/A	N/A	Food Blankets and mosquito nets Shelter kits: tents and tarpaulins Vehicles	N/A
<b>Region: West</b>						

<b>Africa</b>						
Port of Douala	N/A	N/A	N/A	Blankets and mosquito nets Cooking sets and household items Shelter kits; tents and tarpaulins	Food Blankets and mosquito nets Shelter kits: tents and tarpaulins Vehicles	N/A
Port of Matadi	N/A	N/A	N/A	N/A	Food Blankets and mosquito nets Shelter kits: tents and tarpaulins Vehicles	N/A
Port of Pointe Noire	N/A	N/A	N/A	N/A	Food Blankets and mosquito nets Shelter kits: tents and tarpaulins Vehicles	N/A
Port of Tema	N/A	N/A	N/A	N/A	Food Blankets and mosquito nets Shelter kits: tents and tarpaulins Vehicles	N/A

Source: Author, March 2013

The type of relief materials sent by the humanitarian organisation is a function of the type of natural disaster prevalent in the region. Figure 5.3 shows the occurrence of natural disasters in Sub-Saharan Africa from 1900-2015. This was obtained from an advanced search on the CRED website.



**Figure 5.3 Distribution of natural disasters in Africa**

Source: CRED, 2016

### 5.5 Process of sending relief materials

The various humanitarian organisations use different approaches to send relief materials to African countries affected by natural disasters and conflicts. Underlying these approaches is the need for speed, ease, effectiveness, and ultimately, to get results. Some of the humanitarian organisations make use of logistics service providers, while others make use of their own logistics departments. The fundamental issue is to counteract the negative effect of natural disasters and conflict with a positive, speedy inflow of relief materials. The negative impact of natural disasters and conflicts are nullified or mitigated by the positive inflow of relief materials.

A set of actions takes place when natural disasters occur. International organisations, after doing an assessment of the calamity, will want to send relief materials to the emergency site. The cheapest mode of transport for reaching Africa is by sea. The relief materials are cleared in the port, either by logistics providers or by a representative of a humanitarian organisation. After the clearing process, the relief materials are distributed through the local humanitarian organisation to the various groups of vulnerable people. This process is meant to mitigate and reduce the negative impact of natural disasters and conflict.

The following summarises how some of the numerous humanitarian organisations send relief materials.

- UNHCR: supplies its own organisations with relief items
- UNWFP: assists any UN sister agency or non-governmental organisations on a demand basis in signing a memorandum of understanding. This allows for the consolidation of efforts and prevents competition between the humanitarian organisations. It also facilitates co-ordination in the midst of chaotic situations.
- For CARE: the aid provided depends on the relief material. If it is food, the method of sourcing, transport and importation depends on the donor agency. Some donor agencies have their own logistics arrangements, and CARE collects the goods in each country. For others, the cargo arrangements are made from the country of origin. CARE has a standing contract with freight-forwarding service providers who will do the tenders to find a ship or book containerised cargo.
- World Vision International (WVI): When disaster strikes, World Vision International sends a team of experts to assess the situation of the emergency within 48 hours. This is the needs assessment and the findings are compiled into a report. A proposal is then drawn up to determine each item that should be sent, for example, food and blankets. The organisation also determines whether there are sufficient funds to buy the relief provisions required. The World Vision International team will also find out how the raw materials are to be transported to the beneficiaries. If there is to be an international effort, they will determine the optimal form of transport in terms of speed and cost. In determining the ports to use, WVI makes use of the cheapest and most convenient means. For example, to send relief materials to the Horn of Africa, they are routed from the Port of Mombasa, instead of from the Port of Beira, because the latter route is expensive. Cost is critical when sending relief materials. A need exists for proper quantity surveyors to check the cargo, while it is also necessary to comply with the proper port procedures. WVI makes use of the port that is closest to the location of the crisis, and contacts the freight forwarders, who will do the paperwork.
- The IFRC follows the following processes and procedures:
  - assessing the need
    - listing the relief materials needed
    - analysing the best sourcing strategy (using the existing stocks, local/regional procurement and international mobilisation)
    - making deliveries using the most efficient route.

## 5.6 Relief shipments to ports in Africa

Owing to the volume of shipments, it is cheaper to send relief materials by sea. In this section, the respondents mention various problems they encounter in sending relief materials. These issues are

examined regionally. The regions covered in this section are Southern Africa, East Africa and West Africa. North Africa is not covered because North Africa is normally grouped with countries in the Middle East.

The following ports are examined:

- Ports in East Africa: Mombasa, Djibouti, Dar es Salaam, Sudan and Toamasina
- Ports in Southern Africa: Beira, Cape Town, Durban, Maputo, Walvis Bay
- Ports in West Africa: Douala, Pointe Noire, Matadi, Tema and Maranatha

### 5.6.1 Causes of Increase in Cargo Dwell Time for Relief shipments to East Africa

Natural disasters that occur in East Africa, especially droughts, are an urgent matter, because they constitute a recurring problem. The humanitarian organisations mentioned that they encounter the following problems at the ports:

- congestion
- lengthy handling times
- monopolies
- unnecessary delays

Figure 5.5 captures the four major issues that cause delays in the shipment of relief materials via any of the ports in East Africa. These delays increase the container dwell time. These delays will reduce the positive impact of relief materials on the negative effect of natural disasters and conflict.



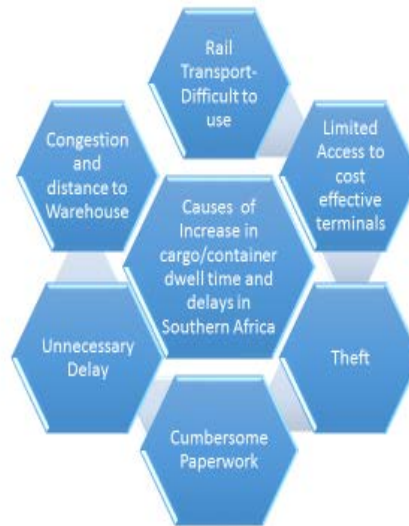
**Figure 5.5 Causes of Increase in Cargo Dwell Time at East African ports**

Source: Author, March 2013



### 5.6.2 Causes of Increase in Cargo Dwell Time for Relief shipments to Southern Africa

In Southern Africa, humanitarian organisations may experience several problems. These delays increase the container dwell time. These problems are shown in Figure 5.6.



**Figure 5.6 Causes of Increase in Cargo Dwell Time at Southern African ports**

Source: Author, March 2013

At the Southern African ports, one of the humanitarian organisations mentioned that a major issue is unnecessary delays with the paperwork. Congestion is another issue. This implies that the relief materials often spend valuable time at the ports. The humanitarian organisations also mentioned the issue of security, implying that relief materials can be subject to theft. These issues are listed below:

- lack of competition amongst the freight forwarders
- limited access to cost-efficient terminals
- congestion
- distance to the warehouse
- paperwork
- theft
- delays in obtaining documentation

### 5.6.3 Causes of Increase in Cargo Dwell Time for Relief Shipments to West Africa

The problems that humanitarian organisations experience in West Africa are listed below and are shown in Figure 5.7:

- reduced capacity
- expectations of gifts from humanitarian organisations (self-aggrandisement)
- paperwork
- congestion
- monopoly of container terminals
- high cost of transactions

The above mentioned issues may cause delays lasting hours, days, weeks and even months in clearing relief materials from ports in West Africa.



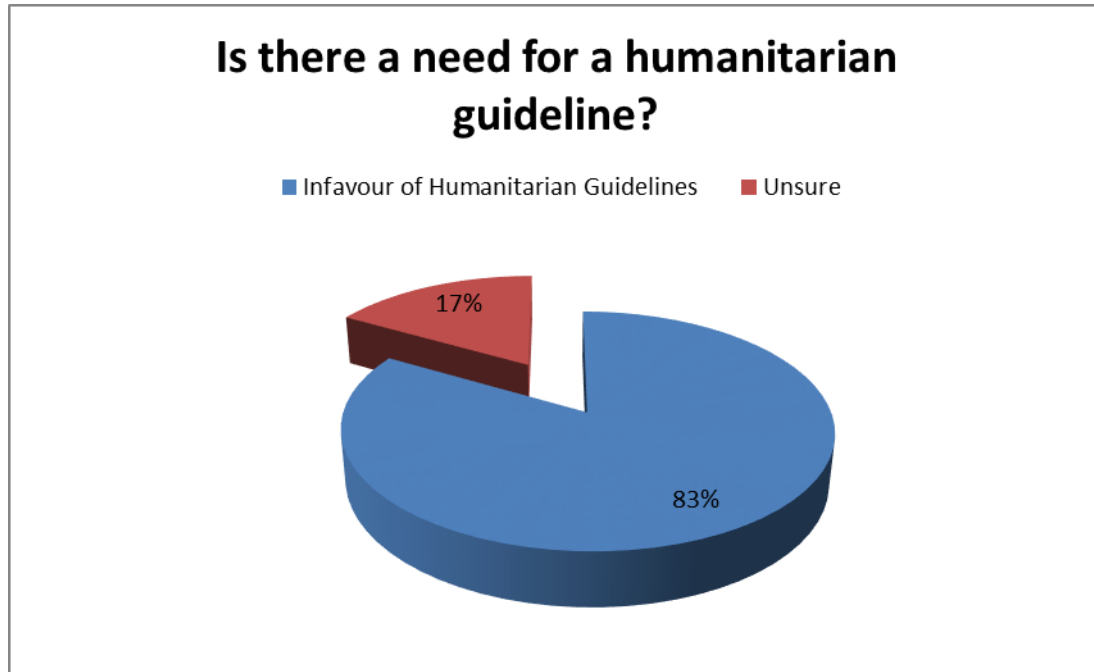
**Figure 5.7 Causes of Increase in Cargo Dwell Time at West African ports**

Source: Author, March 2013

### 5.7 Guideline: humanitarian organisation

It was observed during the course of the research that there are no guidelines in place for the handling of relief shipments. The problems highlighted above could be resolved if there was a proper guideline in place indicating who is responsible for what, when and how action should be taken. From the interviews conducted, it was clear that some of the humanitarian organisation officials do not know who to meet with at the ports in order to assist them in the expediting of relief materials. The six humanitarian organisations covered in this research are representative of all the humanitarian organisations by virtue of their scope, coverage and expenditure in Africa. Of the six

humanitarian organisations consulted, only one was unsure about the need for a guideline. However, representatives from this organisation mentioned that they would be interested to see how the set of guidelines would be implemented and might adopt it. Figure 5.8 shows the responses from the relevant humanitarian organisations to the need for a guideline.



**Figure 5.8 Response for humanitarian guidelines**

Source: Author, March 2013

### **5.8 Consideration of other modes of transport**

Humanitarian organisations will consider other modes of transport in an instance where a disaster has just occurred and there is need to send relief materials immediately. For instance, if the storage of the relief material is in the warehouse of a neighbouring country, then the mode of transportation used may be by road or rail, as in the case of sending grains from South Africa to Zimbabwe. Another factor that can be considered is the volume of the shipment. A large volume of shipments may require deep-sea shipping. In the instance of a sudden natural disaster or calamity, the urgency arises in having to send the necessary relief materials in order to save as many lives as possible. Consideration for other modes of transport may be considered if delays at the ports will pose a major threat to the supply chain.

The fastest mode of transportation is by air, but this is also the most expensive and is limited in terms of the volume and weight of the shipment to be transported (Pan American Health Organisation and World Health Organisation, 2001). Transportation by sea is by far the cheapest and most advantageous in terms of the volume of goods to be carried (Rodrigue, 2013). In 2014, WFP shipped

1.9 million metric tons of relief materials carried in 45,152 containers. In this regard, the ports have a major role to play in distributing relief materials (WFP, 2014).

## 5.9 Conclusion

This section examined the results received from the questionnaire sent electronically to six humanitarian organisations. Their responses were grouped into six subsections, namely:

- presence in Africa
- types of relief materials sent per region
- process of sending relief materials
- problems encountered at the various ports in sending relief materials
- need for a guideline
- consideration of other modes of transport

The purpose of grouping the responses is to enable the development of a guideline that will assist in expediting the flow of relief materials. The fundamental purpose of sending relief materials is to counteract the negative effect of natural disasters and conflict with the positive effect of relief materials. However, this can only be successful if there are no hindrances, bottlenecks or obstacles in the flow of relief materials. In each region the respondents were able to identify four major problems that serve as hindrances to the flow of relief materials.

These problems include:

- delays
- theft
- port congestion
- paperwork

It is expected that the guideline will serve as a tool to enhance the flow of relief materials.

## 5.10 Shipping lines and freight forwarding companies

The shipping companies are important stakeholders in the supply chain of relief materials. Shipping lines and freight forwarding companies have an important role to play in the process of sending relief materials to African countries affected by natural disasters or conflict. When a natural disaster or conflict occurs, the humanitarian organisations contact the shipping company and its agents to assist in the shipment of relief materials to the affected nations. This section deals with the set of responses received from the electronic survey completed by the shipping lines and freight forwarding companies. Relief materials are sent mainly in container ships and occasionally in bulk cargo ships. However, the focus of this study is on relief materials sent in 20-ft and 40-ft containers.

The following are the shipping lines and freight forwarding companies that completed the electronic survey:

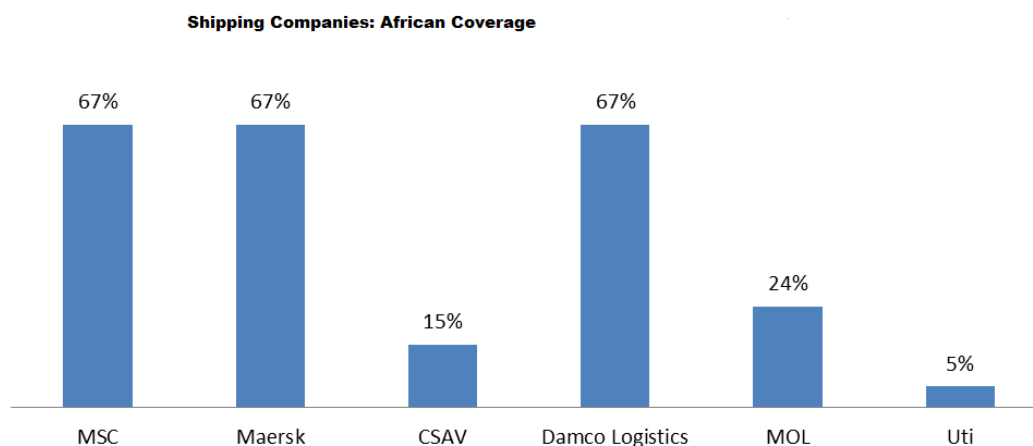
- Mediterranean Shipping Company (MSC)
- Maersk Line
- CSAV
- DAMCO Logistics
- Mitsui OSK Lines
- UTi

This section is categorised into the following subsections:

- Coverage of Africa
- Ports in Africa used in clearing relief materials
- Process of clearing relief materials – case study of MSC
- Preferential services at the ports regionally
- Duration for clearing per port
- Problems at the ports regionally
- Guidelines
- Important factors that should be included in a guideline

### **5.10.1 Coverage of Africa**

The coverage of Africa implies the presence of shipping lines and freight forwarding companies in Africa. It denotes how well they cover Africa. It is important to know that the shipping lines and freight forwarding companies examined handle shipments in Africa. They are familiar with Africa and its inherent problems and peculiarities. This section shows the footprints of the shipping lines and freight forwarding companies in Africa. Figure 5.9 indicates the set of shipping lines and freight forwarding companies to which the electronic survey was sent. Three of the six shipping lines and freight forwarding companies together provide 67% coverage of most African nations, whilst the remaining three provide less than 50% coverage of African nations. In areas where there is less coverage, there may be need for collaboration amongst the companies.



**Figure 5.9 Shipping lines and freight forwarding companies: African coverage**

Source: Author, April 2013

### 5.10.2 Ports used in clearing relief materials

The ports are the gateways through which relief materials enter or leave the country. This subsection specifically shows the ports in Sub-Saharan Africa, which the shipping lines and freight forwarding companies make use of. This gives an indication of the importance of ports in the supply chain of relief materials. The ports are categorised by regions, namely Southern Africa, East Africa and West Africa. The 'X' symbolizes the ports that the shipping company makes use of. These are shown in Table 5.2.

**Table 5.2 Ports used in clearing relief materials**

	MSC	MAERSK	CSAV	DAMCO	MOL	UTI
<b>Southern Africa</b>						
Cape Town	X	X	X	X		X
Durban		X	X	X		X
Luanda	X					
Lobito	X					
Namibe	X					
Walvis Bay		X				
Beira				X	X	X
Maputo				X		X
<b>East Africa</b>						

Mombasa				X		
Dar es salaam				X		
<b>West Africa</b>						
Apapa	X					
Douala	X					
Matadi	X					
Tema	X					
Conakry	X					
Freetown	X					
Abidjan	X					

Source: Author, April 2013

### 5.10.3 Case study of Mediterranean Shipping Company (MSC)

A one-on-one interview was conducted with a representative of MSC. He was able to explain the process and procedure for clearing relief materials from the ports. This process differs between regions.

MSC's office in South Africa also serves Namibia and Angola. In Namibia, MSC makes use of the Port of Walvis Bay, while in Angola it makes use of the Ports of Lobito, Namibe and Luanda. It assists the United Nations World Food Programme (UN-WFP) in shipping relief materials in reefer containers, open-top containers, or as abnormal cargo. The UN-WFP representative contacts the MSC headquarters in Geneva to make the necessary arrangements. These arrangements include:

- freight agreements
- timelines for getting the cargo to its destination

Relief materials are priority cargo, so their delivery is expedited on the feeder vessel. Once the materials are on the feeder vessel, the shipping company ensures that a system of tracking is put in place. Internal tracking makes use of documents such as the bill of lading and delivery orders. External tracking involves the use of the Internet. This allows the humanitarian organisations to track and trace their shipments.

### 5.10.4 Process for clearing at the Port of Cape Town

In cases where shipments are sent from Brazil to Angola, the ship will stop at the following ports: Port of Santos, Las Palmas (transshipment) and Cape Town. Part of the cargo is meant for Cape

Town, as is stated on the manifest, and the other part is transhipped to Angola. Documents are sent to the Port of Cape Town to facilitate the clearing process.

The agent at the loading port will release the bill of lading, which contains all the details of the shipment. The bill of lading is sent to the UN-WFP Headquarters in Geneva, from where it is redistributed to all the ports at which the ship will berth. This information is passed on electronically.

The bay plan shows where the containers are stowed. This will enable the planner to know where to begin offloading the containers, and allows for quick accessibility. The cargo manifest is sent to customs electronically. During the interview, the respondent stated that the cargo manifest must be sent to customs 72 hours before the vessel arrives.

The shipping company can request that the port stack the containers in an easily accessible area. The freight forwarders then arrange for the containers to be cleared. The contract with the humanitarian organisation may be 'door-to-door' or 'port-to-port'.

The freight-forwarding agent, who could be part of the shipping company or an outsourced entity, arranges for the transportation of the containers out of the port. The freight forwarder, if the freight is being outsourced, will come to the shipping line to request release of the cargo. The humanitarian organisation will provide the delivery order. The shipping line has access to the Navis SPARCS system (Port of Cape Town terminal operating system). MSC will update the Navis SPARCS system with the date of delivery and the name of the transporter. The port is now aware of who will carry the container. The shipping line will authorise the port via the Navis system in order to release the container. The truck will then come and pick up the container. The truck officials will present the container terminal order to the port officials.

#### **5.10.5 Ports of Luanda, Namibe and Lobito, Angola**

The deadline for submission of documents to customs is eight days before the vessel arrives. The customs office in Angola is not electronically efficient. The port does not have much storage space for stacking containers. In order to offload the containers, the vessel has to make use of its own gear. To expedite clearing of containers, the shipper has to go through the Ministry of Transportation. For urgent cargo, for example medication, government approval is necessary. The respondent stated that the vessel can be called to offload on an ad hoc basis.

The respondent mentioned that waiting time could be three weeks or more, as was the case between 2006 and 2008. However, the respondent admitted that, waiting time has improved to 4-5 days in most cases. The forwarding agents will come to the shipping line to request release of the cargo



provided that the documentation is in order (bill of lading, customs documentation). The ports are still expanding and as a result, space is limited.

#### **5.10.6 Port of Walvis Bay, Namibia**

The customs infrastructure is well developed like that of South Africa. However, the port is quite small. It requires 72-hour notification prior to the arrival of a vessel. The respondent stated that the waiting time for clearing cargo is between 48 and 72 hours. The respondent mentioned that the port has ship to shore gantry cranes-(SGS), but not rubber tyred gantry cranes (RTGs).

#### **5.10.7 Challenges with the Port of Cape Town**

This section focuses on the challenges that Port of Cape Town faces. This information was received based on the one-on-one interview conducted (MSC, 2011):

- If the wind speed exceeds 72 km/h, the RTG operations in the stack are stopped and as a consequence the quay crane operations have to be stopped as well. This usually happens between November and March. Severe winds can cause all activities to grind to a halt for up to three consecutive days. Shipping lines and freight forwarding companies expect the Port of Cape Town to have cargo-handling equipment that can withstand the wind.
- Rubber-tyred gantry cranes currently work in wind speeds of up to 72 km/h, but the shipping lines and freight forwarding companies expect that the RTG should be able to work in wind speeds of up to 90 km/h.
- Inherent challenges that occur is that the flow of containers into the ports increases gradually from Mondays and peaks on Fridays. This makes Fridays congested times at the Port of Cape Town. However, the port is usually congested on Monday for imports, so there is a challenge for relief materials to be released on Mondays.
- There is congestion at the gate regarding the trucks. The volumes of relief materials do not support a separate gate.

#### **5.10.8 Challenges encountered in the Ports of Luanda, Namibe and Lobito**

This section focuses on the challenges that Ports of Luanda, Namibe and Lobito faces. This information was received based on the one-on-one interview conducted (MSC, 2011).

- Expedition of the clearing of containers requires certain unofficial payments.
- The procedures are not transparent.
- Infrastructural problems exist with respect to road and rail networks.
- Limited storage capacity is available.
- Lack of cargo handling equipment exists.

### 5.10.9 Challenges with the Port of Walvis Bay

- An inability to handle bigger vessels or vessels larger than 2000 TEUs exists as at 2012.
- There is limited storage capacity.
- The port is still in the development stages.

### 5.11 Preferential treatment for the ports regionally

Preferential service refers to the activities the ports put in place to expedite the flow of relief materials. These services are basically for containers loaded with relief materials. The shipping lines and freight forwarding companies were asked if they were given preferential treatment for emergency relief cargo. Table 5.3 shows the type of preferential treatment received from various ports.

**Table 5.3 Types of preferential treatment**

S/N	SHIPPING COMPANY	REGION	PORT	PREFERENTIAL TREATMENT
1	MSC	West Africa	Port of Apapa	None
			Port of Douala	Speed in clearance
			Port of Tema	Little or no paperwork
2.	Maersk Line	Southern Africa	Port of Cape Town Port of Durban Port of Walvis Bay	None
3.	CSAV	Southern Africa	Port of Cape Town Port of Durban	None
4.	Damco Logistics	Southern Africa	Port of Durban	Use of reliable transport companies
			Port of Beira	None
			Port of Maputo	None
			Port of Cape Town	None
		East Africa	Port of Mombasa	None
			Port of Dar es Salaam	None
5	Mitsui OSK Lines	Southern Africa	Port of Cape Town Port of Durban Port of Maputo Port of Walvis Bay	None
6.	UTi	Southern Africa	Port of Beira Port of Cape Town	None

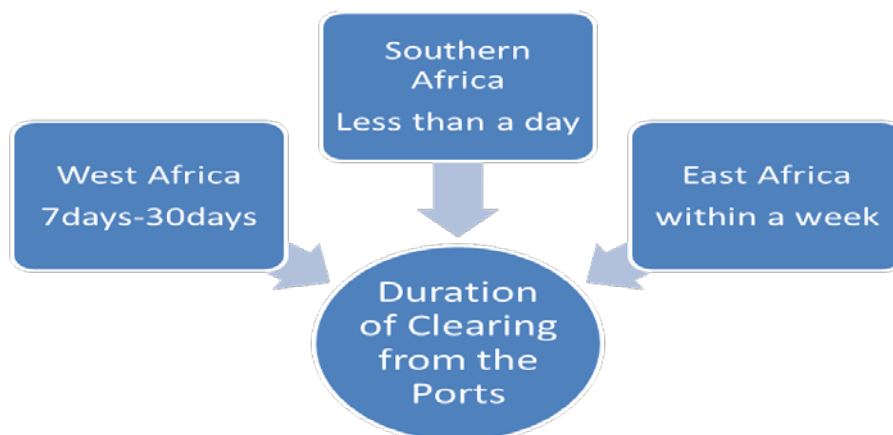
			Port of Durban Port of Maputo	
		East Africa	Port of Djibouti	None
		West Africa	Port of Matadi Port of Pointe Noire Port of Tema	None

Source: Author, April 2013

Table 5.3 indicates that most of the shipping lines and freight forwarding companies do not get any preferential treatment due to the type of cargo they are handling. The lack of preferential treatment shows that ports may not know that the container is laden with relief materials; particularly if the shipping company does not inform the port. This will cause delays in the flow of relief materials. However, the researcher observed that some ports may not need to give shipping lines and freight forwarding companies and their agents preferential treatment, because of the efficiency they portray in clearing containers irrespective of whether they are relief materials or not. Certain container shipping lines and freight forwarding companies such as MSC and Damco Logistics would like to receive preferential treatment in terms of preferential berthing and reduced congestion; as well as a waiver on port charges (Field work, 2013).

### 5.12 Duration for clearing per port

This section examines the duration of clearing regionally. Figure 5.10 shows the average time it takes for containers to be cleared from ports in Sub-Saharan Africa per region.



**Figure 5.10 Duration of clearing**

Source: Author, April 2013

Figure 5.10 indicates that shipping lines and freight forwarding companies making use of ports in West Africa experience the longest delays, often taking up to a month before the cargo is cleared

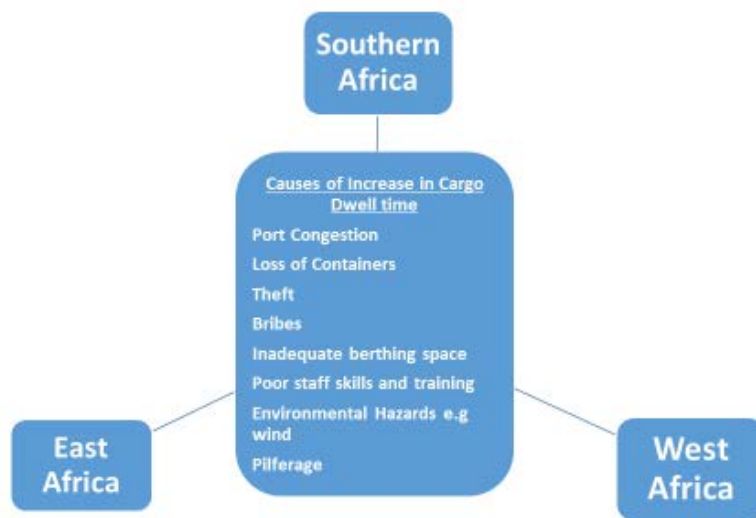
from the port. The implications of this for emergency cargo are significant. Certain ports in Southern Africa such as the Port of Durban are able to clear cargo within hours of the arrival of the vessel. This expedites the flow in the supply chain of relief cargo. Ports in East Africa may also experience delays of up to a week for cargo to be cleared. When there is famine in the Horn of Africa, for example, this delay could lead to the loss of many lives.

### **5.13 Problems encountered in Sub-Saharan African ports**

This section shows the various problems that shipping lines and freight forwarding companies experience at various ports regionally. Figure 5.11 shows the problems that are common to all the ports irrespective of the regions. These problems contribute to the delay at the ports, hence increasing the cargo dwell time. These problems include:

- Port congestion: This implies delay at any time in the maritime supply chain. The delay could be at a berth or even at the terminal, and usually occurs when demand exceeds supply.
- Loss of containers: Shipping lines and freight forwarding companies noted that their containers often got lost at the stacking area. In West Africa, stolen containers are often used as raw materials for building shanties. The contents of the containers are also frequently stolen.
- Damage to containers: Owing to poor handling, some of these containers are not managed well and as such may be damaged. At times the containers fall into the hands of vandals who may attempt to break open the container in order to steal what is inside.
- Bribes: Officials sometimes demand more money from the shipping agents in order to expedite the flow of their shipments. These demands are not part of the ports tariffs.
- Poor staff skills and training: Officials who are not well-trained in crisis management tend to exacerbate the crisis. Shipments that are intended for victims of relief materials need not be unduly delayed.
- Environmental hazards: Winds may cause delays in the ports.

All of the abovementioned problems add to the delay in clearing emergency cargo from the ports in Sub-Saharan Africa.



**Figure 5.11 Major issues encountered in Sub-Saharan African ports that causes increase in cargo dwell time.**

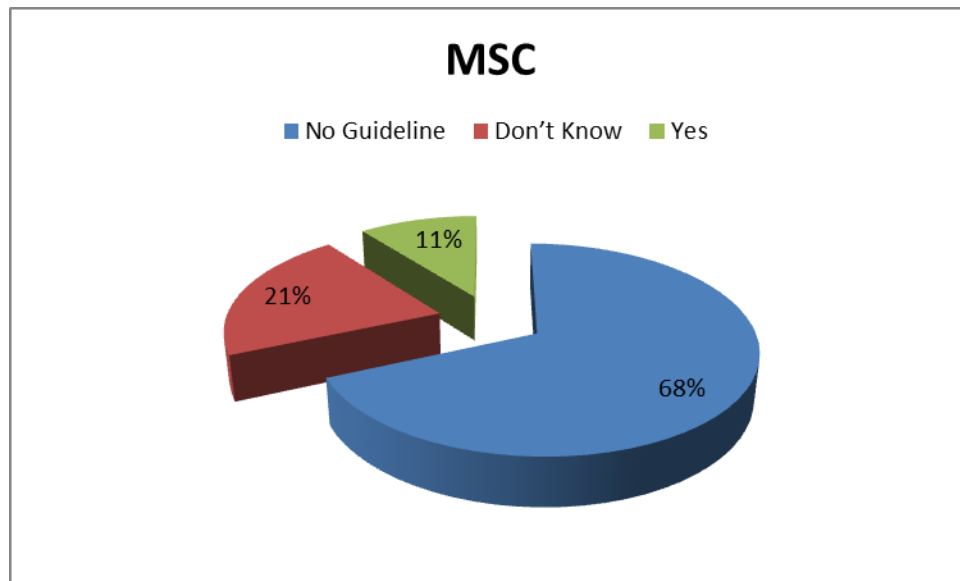
Source: Author, April 2013

#### 5.14 Guidelines

Shipping lines and freight forwarding companies were asked to specify which ports among the 20 well-known ports in Africa have guidelines for humanitarian logistics purposes. They were asked to respond in the following ways:

- Yes – this means that the port has a set of guidelines governing humanitarian logistics and its practices among the various stakeholders.
- No – this means that the port does not have a set of guidelines governing humanitarian logistics and its practices among the various stakeholders.
- Don't know – this means that they are not sure of the existence of a set of guidelines governing humanitarian logistics among the various stakeholders, because they have not seen anything like this.

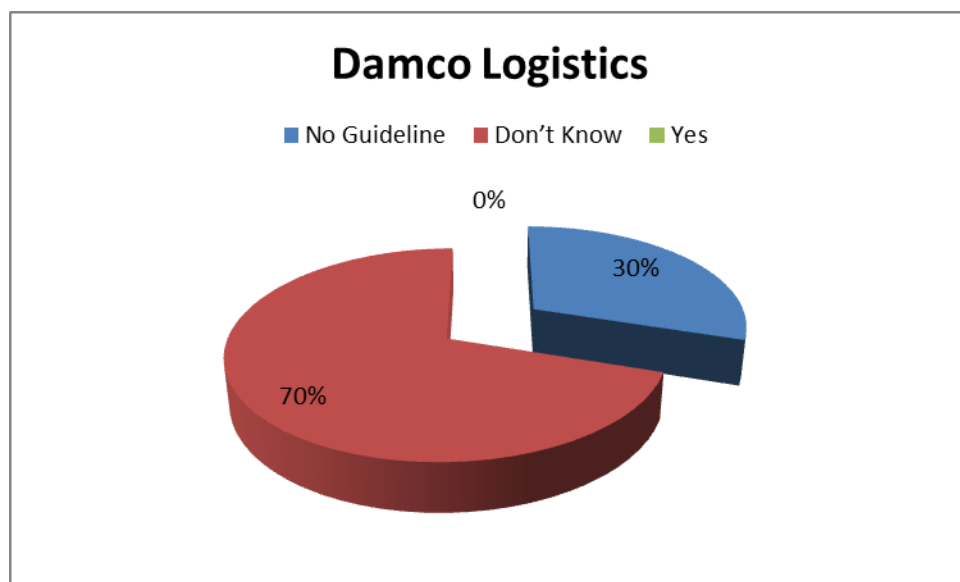
Figure 5.12 shows the response from MSC.



**Figure 5.12 Response of MSC regarding guidelines**

Source: Author, April 2013

According to MSC, 68% of the ports in Africa do not have a set of guidelines governing humanitarian practices in Africa. For the rest of the ports they are not sure and only 11% of ports, particularly in South Africa, have a semblance of humanitarian logistics guidelines. Figure 5.13 shows the response of Damco Logistics.



**Figure 5.13 Response of Damco Logistics to guidelines**

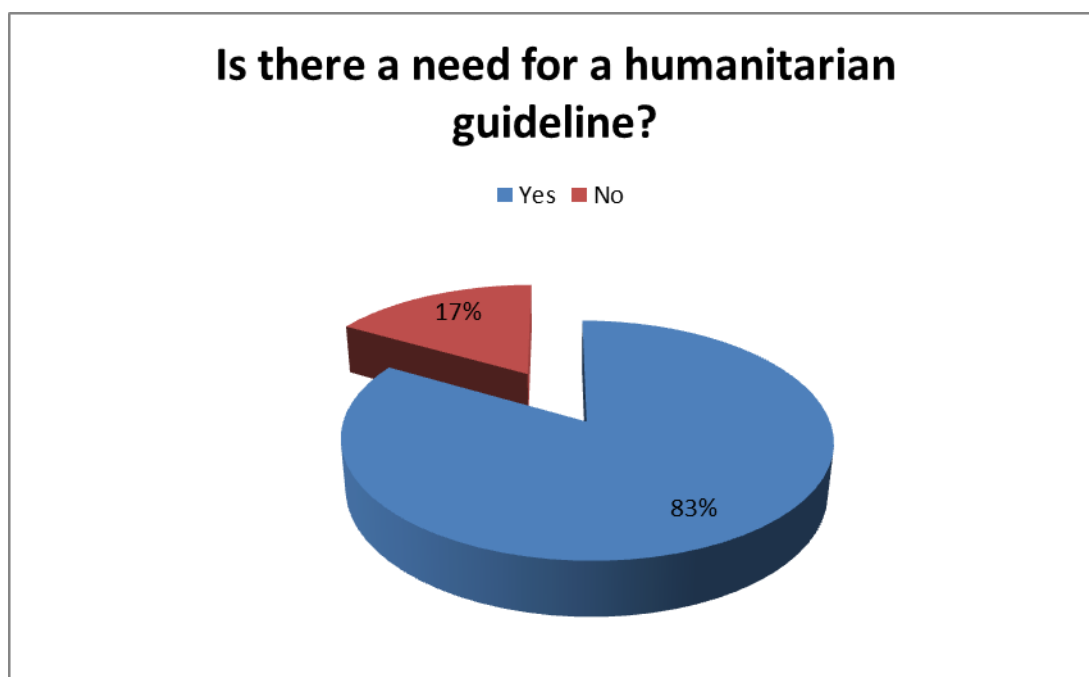
Source: Author, April 2013

For 70% of the ports in Sub-Saharan Africa, Damco Logistics does not know whether a guideline exists. For the remaining 30% they are sure that the ports do not have humanitarian guidelines governing their operations and practices amongst the stakeholders.

All other shipping lines and freight forwarding companies were unsure about the existence of humanitarian guidelines. This is because they have not come across any while dealing with any of the ports.

### 5.15 Response to the need for a humanitarian guideline

This section examines the responses of shipping lines and freight forwarding companies to the need for humanitarian logistics guidelines. Figure 5.14 shows that 83% of the shipping lines and freight forwarding companies are in favour of having a set of guidelines to govern humanitarian logistics operations and practices.



**Figure 5.14 Need for humanitarian guideline**

Source: Author, April 2013

### 5.16 Important factors that should be included in a guideline

There are factors that shipping lines and freight forwarding companies consider important in the facilitation of the supply chain of relief materials. In this section, the shipping lines and freight forwarding companies mentioned what they considered to be important in humanitarian logistics guidelines. These are listed below:

- priority berthing
- co-operation amongst customs and port authorities
- listing of all documentation required so as to ensure quick customs release
- vessel waiting time and cargo standing time
- special customs procedures
- preferential treatment
- waiving/reduction of certain terminal costs
- time frames for unloading/loading of relief cargo
- communication
- special staff incentives (for after-hours shifts)
- equipment
- stacking areas
- personnel

### **5.17 Conclusion**

In the section concerning shipping lines and freight forwarding companies the role of shipping lines and freight forwarding companies in the supply chain of relief materials was examined. This section showed the importance of the role of the relevant shipping lines and freight forwarding companies as well as the various problems they encounter at the ports in Sub-Saharan Africa.

This section also examined the importance of guidelines and what the shipping lines and freight forwarding companies would like to see included in a humanitarian logistics guideline. The emphasis of this section is not on the problems, but on the way forward in expediting the flow of relief materials.

### **5.18 Container Ports and Terminals**

The following major issues are addressed in this section. The ports were categorised into three major regions in Sub-Saharan Africa. The differences among the ports in these regions were investigated. The following ports were examined regionally in Sub-Saharan Africa:

- Ports in East Africa: Mombasa, Djibouti, Dar es Salaam, Sudan and Toamasina
- Ports in Southern Africa: Beira, Cape Town, Durban, Maputo, Walvis Bay
- Ports in West Africa: Douala, Pointe Noire, Matadi, Tema and Maranatha

The following major issues are addressed in this section:

- whether the port has a guideline
- documentation process



- operational issues
- supply chain process
- management
- remuneration
- constraints and solutions
- conclusion

### **5.18.1 Guideline**

According to the Merriam Webster online dictionary, a guideline is a “rule or instruction that shows or tells how something should be done”. This guideline is meant to streamline the supply chain process of handling relief materials in such a way that the stakeholders are given guidance as to what to do. This set of variables is meant to reduce chaos and confusion in the midst of a crisis situation. This section focuses on the response of the ports on the issue of guidelines.

The ports were asked whether they had guidelines for handling relief materials. The responses showed that some of the ports had a set of guidelines for handling relief materials and in other ports examined there had no set of guidelines for the handling of relief materials. For instance, the Port of Mombasa stated in its response that their guideline simply specified that the arrival of the vessel had to be declared 14 days in advance and that the cargo manifest had to be lodged 48 hours prior to the docking of the vessel. This is only for normal port procedures and is not practical for emergency procedures. For Tema Maranatha, the guideline stipulated that they would give priority to relief materials.

### **5.18.2 Documentation Process**

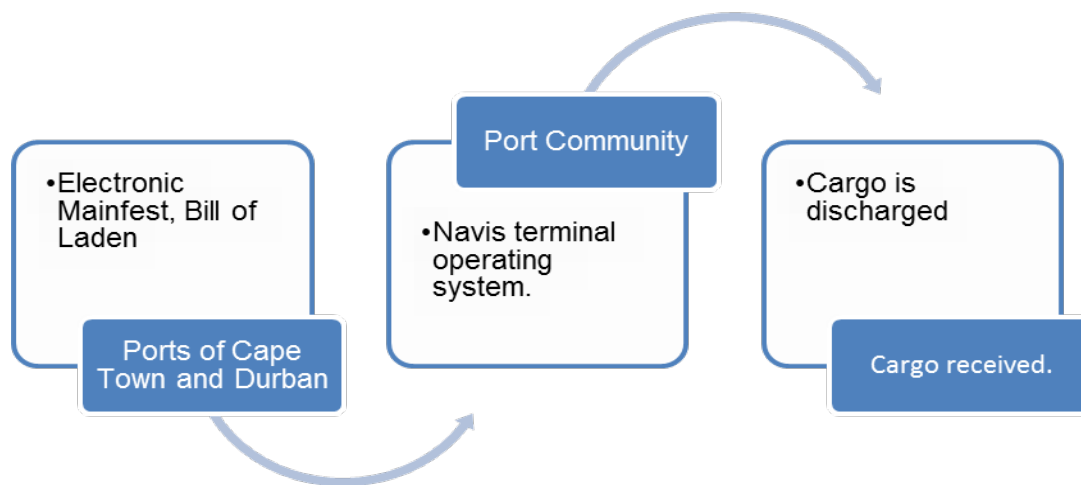
This section examines the documentation process that is activated for each of the subject ports in order to expedite the flow of relief materials. It is noteworthy that all the ports examined stated that they made use of at least one type of terminal operating system. This electronic data interchange enables the ports to be expeditious in the clearing of relief cargo.

#### **5.18.2.1 Port of Cape Town and Port of Durban**

At these ports, the shipping company sends the manifest and bill of lading electronically to the department of logistics in the port. The electronic manifest as well as other relevant documents, such as the stowage plan, must be sent 72 hours in advance of the arrival of a vessel (Transnet, 2016). When this electronic manifest is received by the department of logistics, it is processed by the department of logistics. The internal truck stops under the crane and takes the container to the stacking area. The stacking area also has a copy of the electronic manifest and as such is able to

control the import and export movements. From the Navis system the shipping agent is able to track the status of the cargo. This prompts him or her to get the approved documentation and trailer in order to clear the cargo from the port. The traffic controller will process and clear the container at the administrative level.

At the port gate, the information is already available in the security hand-held device known as the terminal computer. At the exit gate the container is also cleared, based on the information in the terminal computer. Figure 5.15 shows the process flow of the documentation for the Ports of Cape Town and Durban.

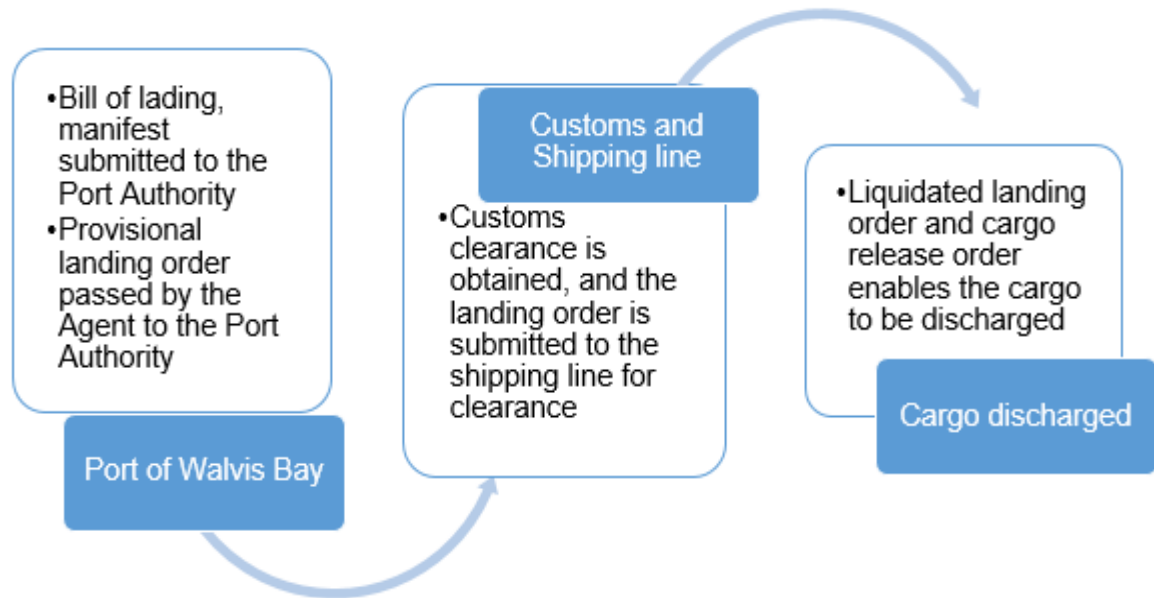


**Figure 5.15 Process paths for the Ports of Cape Town and Durban**

Source: Author, May 2013

#### **5.18.2.2 Port of Walvis Bay**

For the Port of Walvis Bay, the following are the documentary procedures for handling vessels laden with relief containers. The manifest and bill of lading are submitted to the Port Authority and a provisional landing order is submitted by the client. Custom clearance is obtained with a landing order submitted to the shipping line for clearance. This is returned to the Port Authority with a liquidated landing order and cargo release order issued by the Port Authority for the cargo to leave the port. Hard copies of the manifest are submitted if it is impossible to submit electronic copies. The terminal operating systems in use are Navis and SAP. The Port of Walvis Bay does not have a separate department or personnel for processing containers with emergency relief contents. All documents should be sent more than one day in advance to the port in order to expedite the process of clearing the containers. Figure 5.16 shows the documentation process flow for the Port of Walvis Bay.

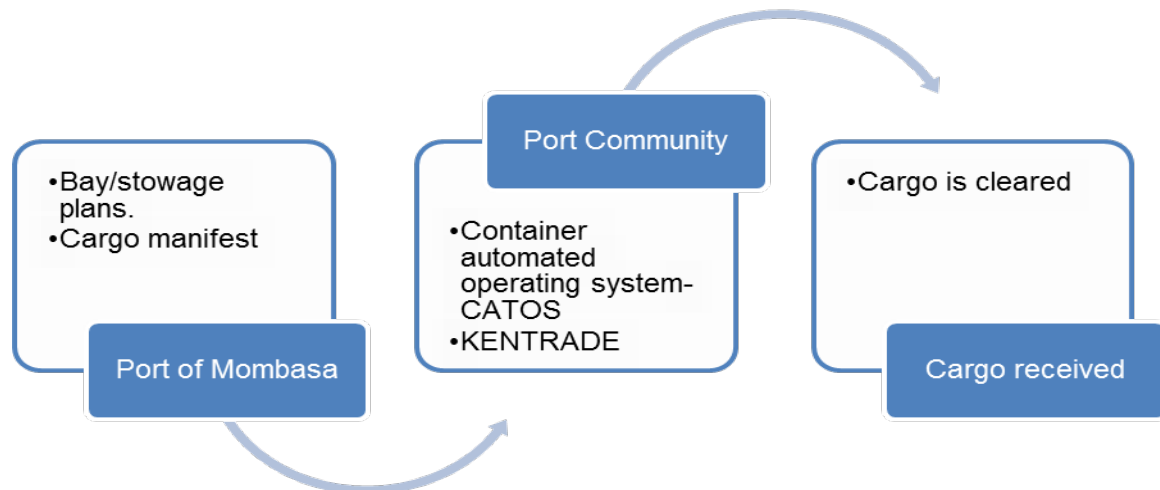


**Figure 5.16 Process path for the Port of Walvis Bay**

Source: Author May 2013

### 5.18.2.3 Port of Mombasa

For the Port of Mombasa, the relevant documents such as the bay/stowage plans, bill of lading and cargo manifest have to be received 48 hours prior to docking. The terminal operating system in place is the container automated operating system known as CATOS. The Port of Mombasa has a separate department and personnel that process containers with emergency relief contents. The documentation and cargo clearance for containers carrying relief material is given priority over other types of general cargo. These documents have to be sent 24 hours in advance in order to expedite the process. The port creates a special window for this type of cargo. The Port of Mombasa also has a port community information system known as KENTRADE. Figure 5.17 shows the process path for the Port of Mombasa.



**Figure 5.17 Process path for the Port of Mombasa**

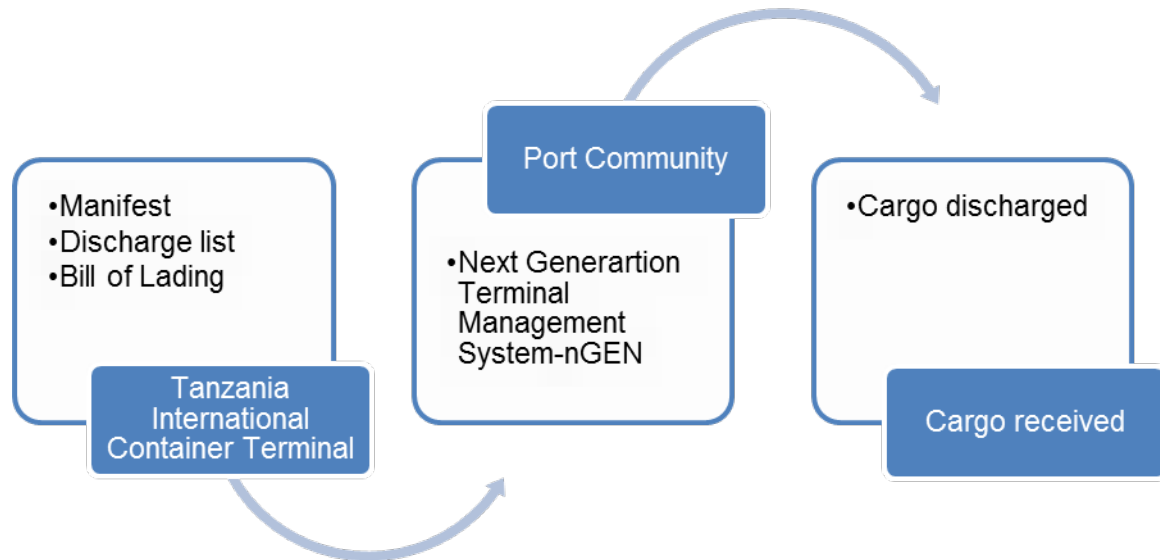
Source: Author, May 2013

#### **5.18.2.4 The Tanzania International Container Terminal (TICT)**

In the Port of Dar es Salaam, the Tanzania International Container Terminal (TICT) requires that the manifest, bill of lading and discharge list are sent electronically to the port. The port sends these documents electronically to the port community portal. This enables the cargo to be discharged from the port and to be received by the consignee. Priority is given to containers carrying relief material, subject to notification and documentation readiness. In order to expedite this process, the documents have to be sent to the ports 24 hours before the arrival of the vessel. The booking time is reduced, or special booking is done for the specified containers. However, the TICT does not have a separate department or personnel for handling relief cargo. The terminal has undergone major changes that include the installation of a new, sophisticated terminal software operating system known as the Next Generation Terminal Management System (nGEN). This system is a modular, scalable terminal management platform that controls the entire scope of operations, including ship and yard planning, gate operations, vessel operations and interactions, yard configuration and performance, overall operations monitoring, equipment use, productivity and cost optimisation. Using powerful algorithms, nGEN is able to offer the most precise and efficient operating solution to its customers.

Radio Data System (RDS), which is the second phase of the implementation of nGEN, went live in April 2012. RDS involves an extension of the Container Terminal Management System (CTMS). It provides staff and equipment (SSG, RTGs and reach stackers) with a means to communicate and interact with nGEN/CTMS in real time so that container information can be updated instantly at the point of loading or unloading. nGEN is designed to help terminal operators to take advantage on the RDS to increase on overall productivity. By means of such a system, instructions and data can

be passed rapidly through the terminal. Mobile workers and container handling equipment have a means to interact with nGEN and update information in real time. Figure 5.18 describes the documentation flow for TICT.

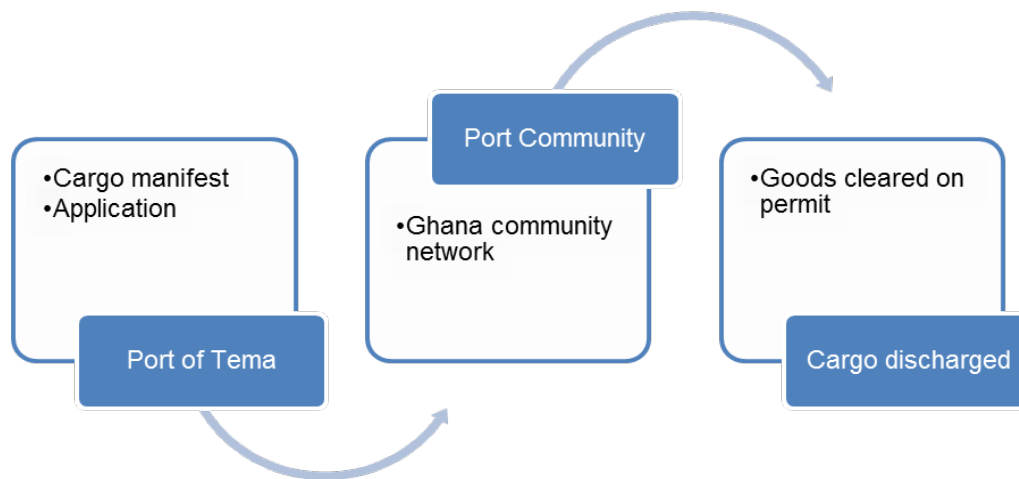


**Figure 5.18 Process path for the Tanzania International Container Terminal (TICT)**

Source: Author, May 2013

#### 5.18.2.5 Port of Tema

The cargo manifest and bill of lading are sent electronically to customs by the shipping lines. Declarations are then made and prepared by the clearing agents. All levies are paid before clearance is allowed. All necessary information is sent through the Ghana Community Network (GcNet). The port does not have a separate department or personnel for handling relief materials. In order to expedite the documentary process, all documents have to be sent 24 hours before the arrival of the vessel. Furthermore, in order to expedite this process, the agent of the consignee makes an application to clear the goods on permit or pre-entry. This is submitted electronically. All documentation is then completed after clearance. The advantage of this process is that goods being cleared on permit or pre-entry do not go through the rigorous documentary checks before the goods are cleared. It is after clearance that rigorous checks are made. Figure 5.19 describes the documentation process flow for the Port of Tema.

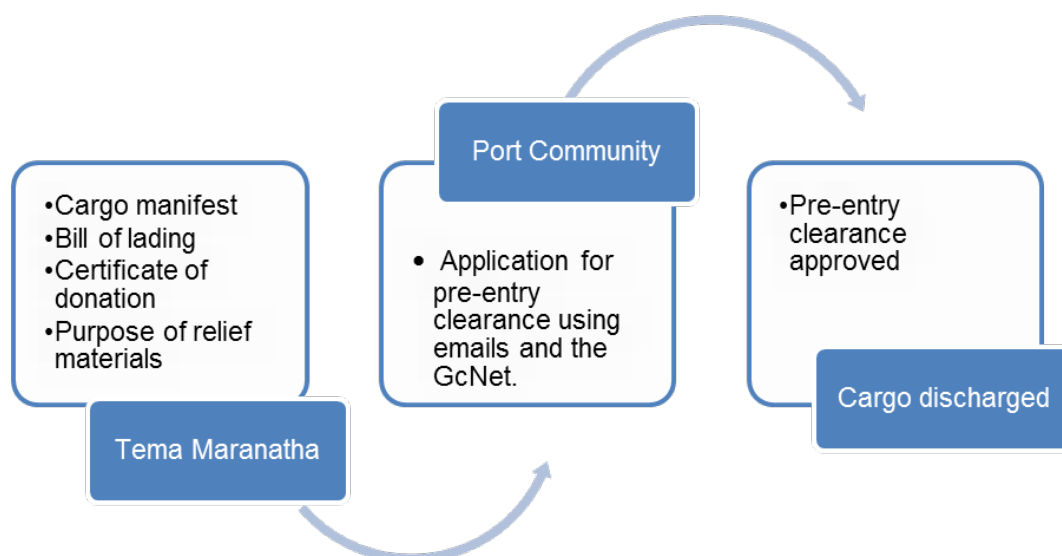


**Figure 5.19 Process path for the Port of Tema**

Source: Author, May 2013

#### 5.18.2.6 Tema Maranatha

For Tema Maranatha the following documents need to be sent to the port via e-mail: the cargo manifest, bill of lading, certificate of donation and the purpose of the relief materials. Tema Maranatha does not have a separate department or personnel for handling relief materials. All supporting documents have to be sent 24 hours before the arrival of the vessel to the customs office at the port for automatic exemption with regards to taxes. A pre-entry clearance to customs also accelerates the process of clearing the cargo. Afterwards the cargo-clearing agency is given the final clearance. Figure 5.20 shows the documentation process flow for Tema Maranatha.



**Figure 5.20 Process path for Tema Maranatha**

Source: Author, May 2013

### 5.18.3 Operational Issues

In this section, the type of preferential treatment that the various ports in Sub-Saharan Africa offer to vessels that are loaded with containers carrying emergency cargo is examined. The ports were asked whether they granted priority berthing to emergency vessels. The advantage of priority berthing is that it will allow the emergency container to be cleared expeditiously. This also has marketing advantages and gives the port an edge over other ports in the region. These operational issues are examined regionally:

#### 5.18.3.1 Southern Africa

- **Port of Cape Town**

Priority berthing is only given to shipping lines that have a standard operating procedure with the port.

- **Port of Durban**

No priority berthing is granted to the shipping company.

- **Port of Walvis Bay**

Priority berthing is given as well as allocation of personnel and equipment for the berthing of the relief shipment

#### 5.18.3.2 East Africa

- **Port of Mombasa**

Vessels with emergency cargo are given priority berthing.

- **Port of Dar es Salaam**

Vessels with emergency cargo are given priority berthing.

#### 5.18.3.3 West Africa

- **Port of Tema**

The vessels are given priority berthing and have reduced documentation when there is a relief shipment.

- **Tema Maranatha**

The vessels are given priority berthing when there are relief shipments.

### 5.18.4 Management

This section considers the issues that concern the management of a port. No matter how automated the port may be, it is the manpower available that determines the efficiency and efficacy of the port (Bestenbreur, 2012). This section also covers aspects such as training, motivation and remuneration packages for port employees.

#### **5.18.4.1 Training**

The ports were asked whether they gave their employees specialised training in the handling of relief materials and if so, what type of training they give their staff. Approximately half of the ports responded that they trained their staff, but it was on-the-job training. The rest stated that they did not provide specialised training for handling relief materials. It is evident that the skills shortage in the supply chain has not been alleviated over the past few years (Barloworld Logistics, 2014).

#### **5.18.4.2 Remuneration**

It is important for port employees to be motivated to perform their various roles and responsibilities (Bestenbreur, 2012). Remuneration could be an excellent motivating factor if productivity is rewarded. Port officials are motivated as follows through remuneration in various regions in Sub-Saharan Africa.

##### **Southern Africa**

- Ports of Durban and Cape Town
  - Productivity incentives for all containers
- Port of Walvis Bay
  - Overtime pay
  - Social security
  - Free uniform
  - Transportation allowance
  - Pension plan
  - Medical benefits/burial assistance
  - Productivity benefits

##### **East Africa**

- Port of Mombasa
  - Overtime pay
  - Night differential
  - Social security



- Uniform allowance
- Transportation allowance
- Pension plan
- Medical benefits
- Death benefits/burial assistance
- Shift allowance
- Profit-sharing
- Productivity benefits
- Promotions and visits to other reputable ports
- Port of Dar es Salaam
  - Bonus for general productivity

#### **West Africa**

- Port of Tema
  - Overtime pay
  - Night differential
  - Shift allowance
  - Productivity benefits
- Tema Maranatha
  - Overtime pay

#### **5.18.5 Port Constraints and Solutions**

This section examines the various constraints that container terminals have in handling containers with urgent relief materials. Port constraints cause an increase in the cargo dwell time at the ports. The port respondents were asked to mention the types of constraints that affect their productivity. The various constraints include the following: quay-handling capacity, berth capacity, quayside transfer capacity, stacking capacity, road collection and delivery issues. Table 5.5 shows these constraints and the solutions that the ports are currently suggesting.

**Table 5.5 Port constraints and solutions**

<b>PORT</b>	<b>ISSUES</b>	<b>SOLUTIONS</b>
<b>Cape Town</b>	Quayside transfer constraints: The wind severely affects the containers operations from time to time.	Purchase of cargo-handling equipment able to operate at higher winds speeds.
<b>Durban</b>	Quayside transfer constraints: The wind severely affects the containers operations from time to time.	Purchase of cargo-handling equipment able to operate at higher winds speeds.
<b>Walvis Bay</b>	Berthing capacity constraints: The port has only three container berths that are occupied throughout the week.  Stacking capacity constraints: The stacking capacity has reached its limits.	Port expansion plans are at an advanced stage.
<b>Dar es Salaam</b>	Stacking capacity constraints: Increased dwell time caused by documentation procedure and poor infrastructure  Road collection/delivery constraints: These are the result of poor infrastructure.	Transfer of containers to inland container depots
<b>Mombasa</b>	Stacking capacity constraints: When there is bunching of vessels, the container yard becomes congested  Road collection/delivery constraints: Poor road and rail network, limitations on axle load and cross-border regulations.	Development of a second container terminal  Development of a second port at Lamu on the northern coast of Kenya.  Engaging central government on improvement of road/rail network  Promoting regional trade by removing cross-border restrictions
<b>Tema</b>	Quay handling capacity constraints: Few berths can accommodate very large vessels. When two	Engaging more stevedore

	large vessels arrive simultaneously, one vessel will have to wait at the breakwater.  Berth capacity constraints: The container handling equipment is a larger constraint than the berth capacity.  Quayside transfer capacity constraints:  Stack capacity is defined at every container depot.	companies  For the long term, the shallow berths need to be dredged more deeply.  Creating more out-of-port freight container depots  Improving the railway system
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Source: Field work, Author, May 2013

## 5.19 Conclusion

The ports were examined regionally regarding their processes for handling relief materials. A set of questions was administered to representatives of ports in Sub-Saharan Africa. This set of questions was aimed at examining the ports according to five critical success factors for handling relief materials:

- Strategic planning
- Inventory management
- Transport and capacity planning
- Information and human capital management
- Continuous improvement and collaboration

### 5.19.1 Strategic Planning

Ports in Sub-Saharan Africa are not particularly strategic with regards to the handling of relief materials, because they consider relief materials to be a part of their normal cargo. However, there are plans underway for port expansion and berth expansion, as can be seen at the Port of Durban and also the Port of Tema, which will expedite the handling of all containers.

### 5.19.2 Inventory Management

This has to do with port resources, the equipment and available manpower at any given time. It is also important for ports to identify what their strengths, limitations and problems are. All the ports were able to identify their respective limitations and problems. They also suggested solutions for dealing with these constraints.

### **5.19.3 Transport and Capacity Planning**

Trucks and cargo-handling equipment are important in the handling of relief materials. The ports examined indicated the number of trucks available. However, a need exists for planning to obtain better equipment. For example, the Port of Cape Town has indicated that it will need to purchase more cargo-handling equipment that is wind resistant. It identified wind as a major issue in the cargo throughput at the Port of Cape Town.

### **5.19.4 Information and Human Capacity Management**

The ports all mentioned that they made use of various types of terminal operating systems and that they benefit from the advantages of using information technology.

With regard to human resource management, the Ports of Tema and Tema Maranatha mentioned that they experienced low staff morale.

### **5.19.5 Continuous Improvement and Collaboration**

There is a need for continuous improvement at the ports. This is evidenced by the increase in the occurrence of natural disasters and the growth of containerisation. Relief materials are shipped in containers. When the issue of guidelines was raised, the ports could not respond affirmatively to this question. It is important for each port to have a guideline that will serve as a framework for its activities with regard to the handling of relief materials. This guideline would also serve as a benchmark for the port's performance.

## **CHAPTER 6: GENERIC GUIDELINE TO HANDLING RELIEF MATERIALS**

### **6.1 Introduction**

Disasters in Africa pose a major hindrance to the continent's ability to achieve sustainable development, especially in view of the region's insufficient capacities to predict, monitor, deal with and mitigate disasters. Countries affected by disasters do not have all the necessary resources to handle the enormous impact the disaster has on its victims. This is why nations in Africa rely on relief aid sent from both developed nations and neighbouring countries. Relief materials are sent via different modes of transport, but the focus of this guideline is on relief materials sent via deep-sea transport in container vessels to affected African nations. This consequently poses a huge demand on the port system to facilitate the clearing of these emergency containers without affecting normal port activity. As speed is important with the supplying of relief materials, ports should not cause a bottleneck in the supply chain of relief materials (Tomasini and Van Wassenhove, 2009a).

From the field work, it was observed that one of the reasons why relief containers are delayed in the port is that the port users do not have all the information or documentation required and as a result they cannot fulfil the requirements of the terminal operator. The fieldwork conducted on ports in Sub-Saharan Africa, namely, the Port of Tema in Ghana, Port of Walvis Bay in Namibia, Tanzania International Container Terminal, Ports of Durban and Cape Town in South Africa and the Port of Mombasa in Kenya showed that ports do not have guidelines for handling relief materials.

### **6.2 Purpose of guideline**

This generic guideline is primarily aimed at reducing the cargo dwell time in ports in Sub-Saharan Africa. It is expected that when the shippers know the correct information and documentation to provide to the ports, it will reduce the cargo dwell time. This guideline is intended to provide information and best practice guidance to port users and other members of the maritime supply chain that have the responsibility for ensuring and/or facilitating maritime trade during emergency situations. For example, East African countries with sea ports such as Tanzania and Kenya have an important role to play in the delivery of relief materials to landlocked countries such as South Sudan, Ethiopia, Uganda and the Central African Republic. Any delay at the Port of Mombasa or the Tanzania International Container Terminal will lengthen the process of delivery at the destination country.

This guideline may be adopted by the Port Authority and other stakeholders at their own discretion. The guidelines are not intended to form the basis for a mandatory instrument. The guidelines stress

the importance of communication between the Port Authority and other port users in improving supply chain resilience and in facilitating maritime trade.

### **6.3 Possible outcome of applying the guideline**

The guideline combines all the information collected through the research into a checklist that can be used by ports, shipping lines and freight forwarding companies and humanitarian organisations to improve the overall efficiency and effectiveness of their supply chains for relief materials. The guideline will provide the stakeholders with prior knowledge regarding the steps for clearing or receiving incoming relief materials, for both food items and non-food items, including the documentation involved in each step and the personnel responsible for each step. The purpose of the guideline is to perform the following functions:

- Provide a step-by-step process of clearing cargo at the port
- Prevent chaos and confusion
- Reduce human error
- Allow for proper communication amongst the stakeholders
- Reduce theft and damages
- Enable port users to have the necessary information to expedite the clearing of relief containers

### **6.4 The guideline structure**

These guidelines have been structured in three parts. The first part relates to the container terminal, namely the role of the container terminal in terms of the provision of excellent service delivery, as well as the port operations and port equipment and facilities that are available to the port users.

The second part involves the shipping line and the clearing and forwarding agent. This section highlights the role of the shipping company and the agent in the clearing of the container at the container terminal. This section also includes a listing of information needs critical to improving the supply chain and facilitating trade following a significant disruption to the maritime supply chain.

The third part contains important issues that are relevant to all stakeholders. This is to enhance the development of communication mechanisms between the parties. Communication is an important enabler of the success or failure of the supply chain of relief materials. All stakeholders in the supply chain of relief materials must communicate with one another to prevent a failure of the entire process.

## 6.5 The process of clearing emergency containers at the container port

### 6.5.1 Documentation requirements

Relief materials encompass a list of various items that are required. The documentation also varies per type of relief material. Table 6.1 shows a list of documents that are required for the clearing of various types of relief materials. All relief materials require the same set of documentation, with the exception of food, medicines, agriculture and livestock, hazardous goods, information technology gadgets and security items. These may all require special permits as required by the country. This section describes the process more clearly, i.e. who is responsible for what and the sequence of documents to be submitted.

**Table 6.1 Documentation required for relief material**

	<b>Container Terminal for the Port of Mombasa</b>	<b>Port of Cape Town and Durban</b>	<b>TICT</b>	<b>Container Terminal Tema and Tema Maranatha</b>	<b>Walvis Bay Container Terminal</b>
Food	Original bill of lading (B/L) Attested invoice Import declaration form (IDF) Final classification and valuation report (FCVR) Tax clearance certificate (TCC) Tax payers identification (TIN) number Delivery order	Commercial invoice, Packing list, clearing instruction and Bill of lading Permits depending on the type of food coming in.	Bill of lading Customs Release order Delivery Order Manifest Tax Invoice	Original bill of lading Attested Invoice Import Declaration form (IDF) Final Classification and valuation report (FCVR) Tax clearance certificate (TCC) Tax payers identification Number (TIN) Delivery order	Original Commercial Invoice Original packing List Original Bill of lading
Medicines	Original bill of lading (B/L) Attested invoice Import declaration form (IDF) Final classification	Commercial invoice, Packing list, clearing instruction and Bill of lading Medicine	Bill of lading Customs Release order Delivery Order Manifest	Original bill of lading Attested Invoice Import Declaration form (IDF) Final Classification	Original Commercial Invoice Original packing List Original Bill

	and valuation report (FCVR) Tax clearance certificate (TCC) Tax payers identification (TIN) number Delivery order Permits and licenses	information control board certificate	Tax Invoice Permits and Licenses	and valuation report (FCVR) Tax clearance certificate (TCC) Tax payers identification Number (TIN) Delivery order Permits and Licenses	of lading Permits and Licenses
Clean water kits Construction materials and tools Agriculture and livestock	Original bill of lading (B/L) Attested invoice Import declaration form (IDF) Final classification and valuation report (FCVR) Tax clearance certificate (TCC) Tax payers identification (TIN) number Delivery order Permits and licenses	Commercial invoice, Packing list, clearing instruction and bill of lading State vet permits and agriculture permits Checked by Port Health when it arrives in the country	Bill of lading Customs release order Delivery order Manifest Tax invoice Permits and licenses	Original bill of lading Attested invoice Import Declaration form (IDF) Final classification and valuation report (FCVR) Tax clearance certificate (TCC) Tax payer's identification number (TIN) Delivery order Permits and licenses	Original Commercial Invoice Original packing List Original bill of lading Permits and Licenses



Blanket and mosquito nets Cooking sets and household items Shelter kits: tents and tarpaulins	Original bill of lading (B/L) Attested invoice Import declaration form (IDF) Final classification and valuation report (FCVR) Tax clearance certificate (TCC) Tax payers identification (TIN) number Delivery order Permits and licenses Original bill of lading (B/L) Attested invoice Import declaration form (IDF) Final classification and valuation report (FCVR) Tax clearance certificate (TCC) Tax payer's identification (TIN) number Delivery order Permits and licenses	Commercial invoice, Packing list, clearing instruction and bill of lading Certificate of Origin Any 2 <sup>nd</sup> hand goods will require an ITAC permit	Bill of lading Customs release order Delivery order Manifest Tax invoice Permits and licenses	Original bill of lading Attested invoice Import declaration form (IDF) Final classification and valuation report (FCVR) Tax clearance certificate (TCC) Tax payer's identification number (TIN) Delivery order Permits and licenses	Original commercial invoice Original packing list Original bill of lading Permits and licenses
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Source: Author, Field work 2014

### 6.5.1.1 Step One

After a major disaster has occurred in Sub-Saharan Africa, the representative of the humanitarian organisation contacts the shipping agent. The shipping agent is given the authority to act on behalf of the humanitarian organisation concerned. The shipping lines or their agents should prepare and generate the following documents. This is a function of the requirements of each port.

- **Bills of lading**  
The bill of lading is the document that shows who owns the cargo by indicating the name, address of the receiver; describes the cargo in terms of quantity and content of containers and also shows the vessel that will carry the cargo.
- **Certificate of conformity**  
Intertek, SGS and Bureau Veritas are responsible for the conformity inspection of certain commodities such as agricultural products and food that require inspection. These accredited agents will issue the shipper a certificate of conformity and the test results.
- **Import declaration form**  
The import declaration form must be obtained from the relevant revenue authority in the destination country. The import declaration includes key information such as quantity; quality and the value of the cargo.
- **Manifest**  
The manifest shows the list of all the cargo on board. This includes the actual weight as well as the volumetric weight. This gives a detailed summary of all bills of lading.
- **Manifest correctors**  
This indicates corrections made on the original manifests.
- **Telex release**  
A release can be done via telex. This can serve as an alternative to the bill of lading.
- **Freight invoice**  
This is the freight bill. It includes all the charges for the freight.
- **Stowage plan**  
This shows how the containers are stowed on the vessel. It is to facilitate the easy discharge of the container from the vessel.
- **Packing list**  
This describes the list of goods in detail. This list must also correspond with that which is stated on the bill of lading and the commercial invoice. The packing list must include the number, description, weight in metric tons, length in metres, width in metres, height in metres and the cubic measurement of all the packages.
- **Commercial invoice**

This is the document required by the customs of the destination country. It should state the true value of the imported goods. This is to assist in determining the duties and taxes. The commercial invoice must identify the buyer and sellers determine the date and terms of sale, quantity weight and volume of the shipment, state type of packaging, provide a complete description of goods, and state unit value and total value of the shipments and the insurance, shipping and other charges.

- **Dangerous goods manifest**

This is a record showing the list of dangerous goods that are being carried. These goods should be in compliance to the carriage of dangerous goods policy.

- **Delivery orders**

This is a written directive from the shipper of the shipment to the carrier of the shipment to release the shipment to a named delivery party.

#### **6.5.1.2 Step Two**

The shipping line may contact a clearing and forwarding agent to act on their behalf at the port. Prior to the arrival of the vessel, the shipping line must lodge the manifest electronically into the customs web portal and the Port Authority web portal. This customs declaration must be done before the arrival of the vessel within a stipulated time period. The shipping agent must mention what special needs are required for the cargo. A customs entry is prepared against the submitted electronic manifest.

The clearing and forwarding agent then sends the documents (see Table 6.1) electronically to the port and to customs.

#### **6.5.1.3 Step Three**

All documents are verified by customs. In certain instances, if necessary, the cargo itself is verified at a specified location. One hundred percent (100%) verification occurs when there is no disparity between the documents lodged, for instance, the electronic manifest versus the packing list.

#### **6.5.1.4 Step Four**

Payments are made through the banks to the ports and customs. The bank proof of payments and receipts facilitate the release of the cargo.

#### **6.5.1.5 Step Five**

Agents arrange for the goods to be moved by a haulage company.

### **6.6 Guidelines for the various stakeholders**

It is better to have different guidelines for different primary players. This guideline serves to assist the stakeholders in the operation and discharge of relief shipments. Table 6.2 shows the various guideline

principles that ports, shipping lines and freight forwarding companies and humanitarian organisations can adopt.

### **6.6.1 Important Issues for humanitarian organisations**

From the interviews conducted during the field work with the representatives of the humanitarian organisations, it was stated that “Ports have their own guidelines, but none of the ports in Sub-Saharan Africa, which participated in the study have a guideline that caters specifically for humanitarian relief materials”. For the humanitarian organisations examined in section 5.3., the issue of long handling times, delays and congestion are crucial in the handling of relief materials, since this relates to time and speed.

#### **6.6.1.1 Strategic planning**

Strategic planning is important to the success of the supply chain of relief materials. The major aim of the supply chain is to ensure that relief materials are delivered to the victims of natural disasters and conflict as quickly as possible. As a result of the complex nature of natural disasters that occur suddenly, there is a need to have a contingency plan. The major stakeholders need to plan ahead in the following way:

The fact that disasters are unpredictable means that the humanitarian organisation has to plan ahead in terms of resources, people, money and time. The humanitarian team needs to have contact people in the regions where disasters are most likely to occur. The humanitarian team also needs to plan strategically how to source the funds, manpower and other relief supplies that will be needed in the event of a natural disaster or conflict.

Funds are usually limited. Donors are also limited. Hence, humanitarian organisations need to have a mechanism in place that will address the issue of generating funds for emergency situations.

Humanitarian organisations need to be knowledgeable regarding the requirements for shipping relief materials to ports in Sub-Saharan Africa. Prior knowledge of these requirements will ensure that all the documents needed are given to the shipping lines, clearing and forwarding agents and other maritime partners in order to expedite the flow of the relief materials.

#### **6.6.1.2 Procedure**

Knowledge of the port procedures and requirements makes the process easier for all parties involved. This allows for clarity and prevents confusion.

The humanitarian organisation concerned needs to have a set of procedures to guide the handling of relief materials. This set of procedures should state issues such as: security, special handling of cargo, storage, safety and other issues that are crucial to the handling of the relief materials.

#### **6.6.1.3 Proper documentation**

The documentation process can be complicated. To prevent further complications, all maritime stakeholders must be aware of the documentation required.

Some ports require that the humanitarian organisation ought to provide information on the source of the relief materials. As a result, all the required documents should be sent to the shipping agent in order to prevent any form of delay.

#### **6.6.1.4 Communication**

A major source of failure in the supply chain of relief materials is the breakdown of communication amongst the stakeholders.

The humanitarian organisation needs to be able to communicate effectively and regularly with the shipping agent and the ports. This is important to ensure the success of the humanitarian delivery. The process needs to be monitored by the humanitarian organisation to ensure that all is going well in the field of operation.

#### **6.6.1.5 Setting the standard**

The humanitarian organisation should be aware of the standard operating procedures of the port and the shipping line. This is important to ensure that all parties are aware of the standard. It also prevents any matter that can affect the integrity of all other stakeholders.

#### **6.6.1.6 Test**

Lack of knowledge can further worsen a chaotic situation. The knowledge base of the stakeholders should be tested to ensure confidence.

The humanitarian organisation needs to test its skill set. This is important with regards to ports in Sub-Saharan Africa. A number of humanitarian workers get to the emergency field and are confused. To prevent confusion in a chaotic environment the humanitarian workers should be trained prior to emergency situations on issues relating to the Sub-Saharan region.

#### **6.6.1.7 Maintenance**

This comprises deliberate steps taken to repair or ensure proper workings of a relationship or equipment.

The humanitarian organisation ought to maintain all its resources. Resources include donors. Relationships with donors must be well maintained. In addition, tools that will be sent as relief materials must also be in a good condition.

**6.6.1.8 Local involvement**

Emergency situations occur in large proportions. This may require the involvement of local teams to ensure success.

Relief materials may be sourced locally. In addition, local residents may volunteer their assistance in the packaging of the relief materials. The local team can be instrumental to raising funds and awareness for the emergency situations.

**6.6.1.9 Back-up**

This is an alternative plan to the original plan. In an emergency situation, it is necessary to be flexible, especially in decision making.

The plan to make use of a particular port or shipping agent may change as a result of certain considerations. There may be a need to make use of other ports in the region.

**6.6.1.10 Collaboration**

Collaboration occurs when the stakeholders work together in order to achieve a goal. Collaboration is important to the success of the emergency event.

There is need for the humanitarian organisation to liaise effectively and efficiently with the other stakeholders to ensure the success of the entire supply chain.

**6.6.1.11 Feedback**

There is a need for appropriate recording of the entire emergency process of the emergency event. When the entire emergency process is reviewed, there may be areas where there are shortfalls. The purpose of this is to ensure continuous improvement. There should be a forum for providing feedback about the whole emergency event.

The humanitarian organisation, having reviewed the entire process for a particular emergency event, must be able to give the other stakeholders feedback. This is information about the areas and aspects of the event that they did well and the areas where they did not perform optimally.

**6.6.2 Important Issues for shipping lines and freight forwarding companies**

Shipping lines and freight forwarding companies prefer humanitarian relief materials to be handled with urgency and speed. Issues that can cause delay should be sorted out before the arrival of the vessel. For the shipping lines and freight forwarding companies examined in section 5.10, the following are issues that the shipping company respondents stated that is crucial to the supply chain of relief materials:

- effective means of communication between all stakeholders (port operations; shipping agents and humanitarian organisations)
- security matters: prevention of loss and damage of containers
- priority sequencing of the discharging of relief materials via instructions or request to work at a particular bay
- separate stacking of relief cargo in stacking areas to allow for accessibility (exceptional operational arrangements)
- separate truck lanes for relief materials to avoid congestion.

#### **6.6.2.1 Strategic planning**

The shipping agents act as the link between the ports and the humanitarian organisations. Their role is crucial in the sense that they need to work with speed to ensure the clearing and delivery of the cargo. However, this is a function of their knowledge of the port procedures and requirements. It is essential for the shipping agent to have contact persons at the ports.

The shipping agents should have a detailed procedure to be followed at the subject port. They should be able to meet all the requirements from documentation to making all the necessary payments. The shipping agents should be part of a strategic plan ahead of emergency situations.

#### **6.6.2.2 Procedure**

The shipping agents should ensure that they comply with both the port's procedures and the humanitarian organisation's requirements. The shipping agent must immediately inform the port of the arrival at berth of the emergency cargo. The shipping agent must also be aware of the port procedures for handling relief cargo.

#### **6.6.2.3 Proper documentation**

The shipping agent needs to inform the port of the types of relief materials that are being shipped via the port. It is consequently necessary for the shipping agents to ensure that they comply with the various sets of documents required to clear the various types of relief materials.

#### **6.6.2.4 Communication**

The shipping agent should inform the port of any intention to ship in relief materials. This is important to the port, because it will enable the port to plan ahead of the emergency container vessel.

#### **6.6.2.5 Setting the standard**

The shipping agent needs to know what the standards are in the port in order to ensure that it conforms to such standards.

**6.6.2.6 Test**

The shipping agents need to test their skill set with regards to ports in Sub-Saharan Africa. The shipping agents need to be conversant with and tested on their knowledge base, especially with regards to requirements at ports in Sub-Saharan Africa.

**6.6.2.7 Maintenance**

The relationship with the relevant humanitarian organisation must be maintained as professionally as possible. Furthermore, the trucks that will be used to convey the emergency relief containers must always be in good condition.

**6.6.2.8 Local Involvement**

The shipping company may collaborate with local labourers to help with the unpacking and distribution of the relief materials.

**6.6.2.9 Back-up**

The shipping agent must be able to source additional trucks if the number of trucks ordered is not sufficient to handle the inflow of relief materials.

**6.6.2.10 Collaboration**

The shipping agent cannot handle the relief materials without effective collaboration with the other stakeholders. Within the supply chain, collaboration will enhance the distribution of knowledge (Haugstetter and Cahoon, 2010) .

**Feedback**

After the emergency event, the shipping agent must be able to highlight areas where it can improve upon. The aim is to ensure continuous improvement.

**6.6.3 Important issues for Ports Authorities**

Ports do not want to delay the cargo unnecessarily. However, for the ports examined, the following issues are crucial to the supply chain of relief materials:

- timeous submission of all documentation on time
- proper completion of all the necessary documents
- complying with port rules and regulations
- ensuring payment of all port dues and charges
- declaration of all cargo

**6.6.3.1 Strategic planning**

The Port Authorities as well as other maritime actors need to have skilled people who are able to handle emergency situations and expedite the process flow of clearing relief materials. For all



emergencies, timing is crucial. A delay at the port level could spiral and so possibly lead to loss of life.

Furthermore, in the case of emergency situations the port should have a set of procedures that overrides the normal procedure (Field work, 2014). However, this will only be effective if the port has planned ahead for emergency situations. Effectiveness is also based on the assumption that the Port Authority is informed ahead of time of a consignment of relief materials.

Port resources such as berths; cargo-handling equipment; container yards and warehouses help to facilitate the maritime supply chain of relief materials. Ports that have limited infrastructure will need to plan how to overcome these deficiencies.

#### **6.6.3.2 Procedure**

Port procedures should also be known to the other stakeholders. These procedures include the time by which all documentation should be lodged; the tariffs and duties that need to be paid; berth availability; cargo-handling equipment etc.

#### **6.6.3.3 Proper documentation**

As a result of the various types of relief materials that are being sent through the ports; there are various documentation requirements that require compliance. The documentation requirement for food differs from that of sanitary packs etc.

#### **6.6.3.4 Communication**

The ports need to have the necessary infrastructure to communicate effectively with the other maritime players. The maritime players need to communicate with the shipping agents with respect to the facilities they have on ground. If, for example, the port does not have cargo-handling equipment to handle the tonnage being shipped, it is essential that other maritime players know this in order to make other necessary plans.

#### **6.6.3.5 Setting the standard**

The port needs to state categorically what its operational standards are. This will enable the shipping line to align itself to this standard, and will also allow for conformity.

#### **6.6.3.6 Test**

The port should test its resources, for example, all its cargo-handling equipment. The port skill set should also be obliged to undergo a humanitarian drill. This will provide a true picture of the skill and resource set of the port. It will ensure that Port Authorities make accurate decisions concerning what to do in order to develop their skill set.

### 6.6.3.7 Maintenance

The Port Authorities should ensure that all its facilities and equipment are in good working condition at all times.

### 6.6.3.8 Local Involvement

At the port level, if the manpower is not sufficient to handle the influx of relief materials, it may be necessary to employ casual workers from amongst the local residents.

### 6.6.3.9 Back-up

The port should have an alternative plan with regard to any of its resources if there is a need to employ more casual labour. The port must not be rigid with regard to making alternative plans if the original plan is not working.

### 6.6.3.10 Collaboration

The port needs to collaborate with the other stakeholders in order to ensure the success of the supply chain of relief materials.

### 6.6.3.11 Feedback

The port must also take a closer look at the entire emergency process and event and see where there are shortfalls and successes. This will enable the port to make adequate plans and improvements.

Table 6.2 shows the guidelines for the various stakeholders. This table shows the principles that guide each of the maritime stakeholders.

**Table 6.2 Guidelines for the various stakeholders**

Principle	Ports	Shipping company	Humanitarian organisation
Strategic planning	Strategic planning for the expansion of container terminals; warehousing; cargo- handling equipment and training of personnel. Assigning the personnel or team that will work in an emergency scenario	Strategic planning in order to expedite the process. Knowledge of who to contact in the ports. Assigning the team that will work in an emergency scenario.	Strategic planning as to the shipping company and ports that will deliver the shipments expeditiously. Assigning the team that will follow up on the shipment at the port of origin and destination.

Setting procedures that will be abided with	Proper procedure for handling relief materials Personnel should be trained to understand and implement procedures for handling relief materials.	The team should know the port procedures;	Awareness and knowledge of port procedures and practices.
Proper documentation	The required documentation for the clearing of relief cargo must be clear and without ambiguities. Avoidance of errors Avoidance of missing documents	Compliance with the necessary documentation Avoidance of sending in the wrong information Monitoring of all documents sent Having back-up documents	Proper documentation of all information needed for the expeditious delivery of relief materials
Communication	All the key port officials should be well informed of the shipment of relief cargo. The information should be passed on to all the stakeholders. If there is a problem at the port, for example strike action, this too should be communicated to the shipping company. The port should ensure that in all situations the shipment can be tracked and traced in real time.	Integration of information Inform the ports of the expected time of arrival. The humanitarian organisation must be informed of the status of the shipment.	Free flow of information between the stakeholders with regard to the shipment
Setting the standards	The paperwork such as forms and application process should be uniform. The process and procedure that needs to be activated during emergency should be uniform in all the port's branches. The paperwork should be simple to understand and not too lengthy. The standards should not	Conforming to the prescribed standards of the ports Ensuring that the port is aware of the shipping company's standards and practices	Conformity with the port's standards The shipping company should also be aware of the humanitarian organisation's expectations and standards.

	be compromised and they should be known and acceptable to all the stakeholders, for example, when demurrage is charged.		
Testing	The ports should ensure that all the cargo- handling equipment is in good order. If possible, the port should carry out emergency drills.	Testing the assigned employee to determine their knowledge of the ports and their procedure.	Testing the level of compliance amongst the staff to the port procedures and practices Ensuring that the humanitarian organisation team is aware of the port's processes and procedures
Maintenance	Proper maintenance of all machines and equipment	Ensuring that the trucks that will be used to transfer the containers are in good condition The relationship with humanitarian organisation must be professionally maintained.	All tools should be maintained. The relationship with donors ought to be maintained.
Local involvement	The need may arise to involve casual labour.	A need may arise to involve local expertise in order to expedite the process.	If necessary, local labour and expertise may be implemented for effective delivery.
Back-up	There should be an alternative plan if there is a problem with the original plan.	Having a Plan B if the port is not able to perform due to unforeseen situations	Having an alternative plan if the present plan seems to be failing
Collaboration	The need for collaboration with other port authorities in order to improve	The need to collaborate effectively with the port officials	The need to collaborate with officials of the ports as

			well as the shipping company officials.
Feedback	There should be a forum for feedback amongst the stakeholders.	There should be a forum for feedback amongst the stakeholders and a means of improvement on existing practices.	There should be a forum for feedback; this will enhance improvement.

Source: Field work, Author, June 2013

### **6.7 Supply chain of relief materials: interchange of documents amongst the maritime stake holders**

This section deals with the line of action to be followed, especially amongst the stakeholders. The stakeholders include the importer (humanitarian organisation), the shipping line, customs, trucking company, container port and, if necessary, the agent. After the occurrence of a natural disaster, the humanitarian organisation makes its intention of shipping relief materials to the specified destination in Sub-Saharan Africa known to the shipping company. The shipping company then informs the port of origin and destination about the shipment of relief materials. The port activates the plan of action based on all the information received from the humanitarian organisation and the shipping company. Each of the stakeholders has a line of action that needs to be activated in order to expedite the supply chain of relief materials.

The representative of the humanitarian organisation (importer) needs to have obtained an import permit, the container needs to be cleared by customs, the shipping line freight charges need to have been paid and the container port cargo dues need to have been processed before the line will release the container. The importer has the choice of using “carrier haulage” where the shipping line is responsible for the cargo from the origin packing station to the destination delivery station including providing landside transport and effecting the customs clearance on behalf of the importer. Alternatively, the importer can use “merchant haulage” where a clearing and forwarding agent is contracted to provide the landside transport at both ends and effect customs clearance on behalf of the importer, while the shipping line is only responsible for the sea passage of the container.

The port system is automated. The port will get involved once the container has been released by the shipping line and a trucking company has been assigned to collect the container. All the port dealings in the discharging of the container are with the shipping line only. As a result, the shipping company and humanitarian organisation are able to track and trace their shipment electronically.

After the whole operation has been completed, the stakeholders ought to be able to give feedback to one another in order to track their performances and to be able to improve in the areas where there may be deficiencies or lapses. This means that these operations need to be well documented. Figures 6.1-6.4 describe the process and how the information flows work for the ports of Mombasa, TICT, Tema and Walvis Bay respectively, while Figure 6.5 shows the generic import document flow.

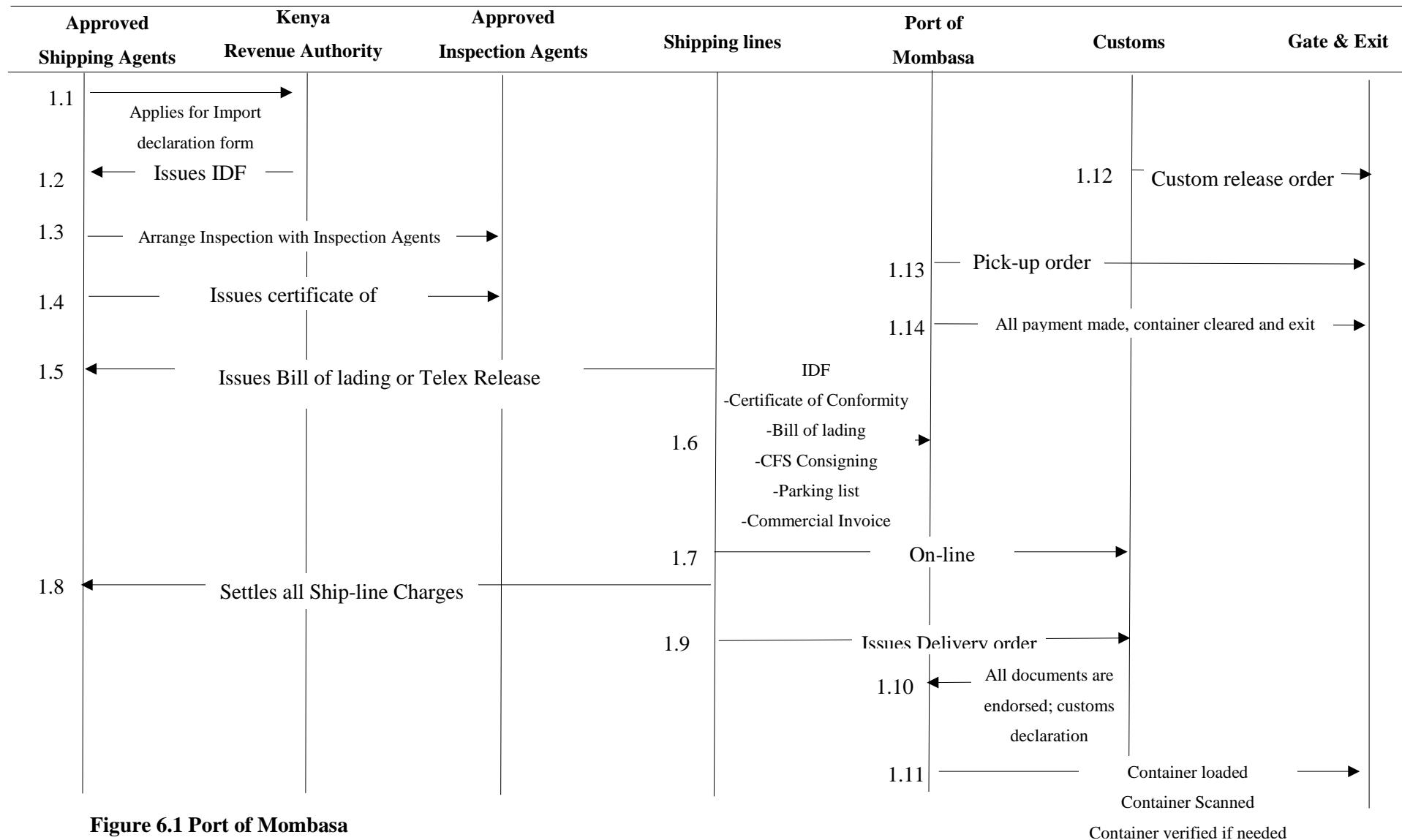
These figures show the import process flow for the selected ports. This section explains who is responsible for every leg of the supply chain. Each part of the selected container ports documentation flow is examined. Figure 6.5 shows the generic flow of document from the humanitarian organisation to the clearance from the gate.

For the Port of Mombasa, depicted in Figure 6.1 the supply chain starts from the humanitarian organisation. The shipping agent represents the humanitarian organisation in terms of clearing the cargo at the Port of Mombasa. The shipping agent applies for the import declaration form, known as the IDF, from the Kenya Revenue Authority (KRA). The Kenya Revenue Authority then issues the IDF. After this, the importer proceeds and arranges for the inspection of the cargo by accredited inspection agencies such as Intertek, SGS and Bureau Veritas. The inspection agency issues a certificate of conformity. All documents such as the bill of lading, certificate of conformity, packing list, commercial invoice, exemption letter (for charities) must reach the Port of Mombasa seven days prior to the vessel's arrival.

The shipping line lodges its online manifest with customs and the Port Authorities. By virtue of the uploaded manifest, a customs entry is prepared electronically by the clearing agent. While the manifest is being uploaded by the shipping line, the original bill of lading is endorsed by the consignee and is submitted to the shipping line for the issuance and release of the delivery order. All the entries are passed after the payments of duties or confirmation of exemption into the customs system.

All documents are checked and endorsed by customs. These endorsed documents are dispatched to the point of final clearance, which is at the Port of Mombasa. The containers are loaded on standard trucks to the final destination.

## Port of Mombasa



**Figure 6.1 Port of Mombasa**

Source: Author, 2014

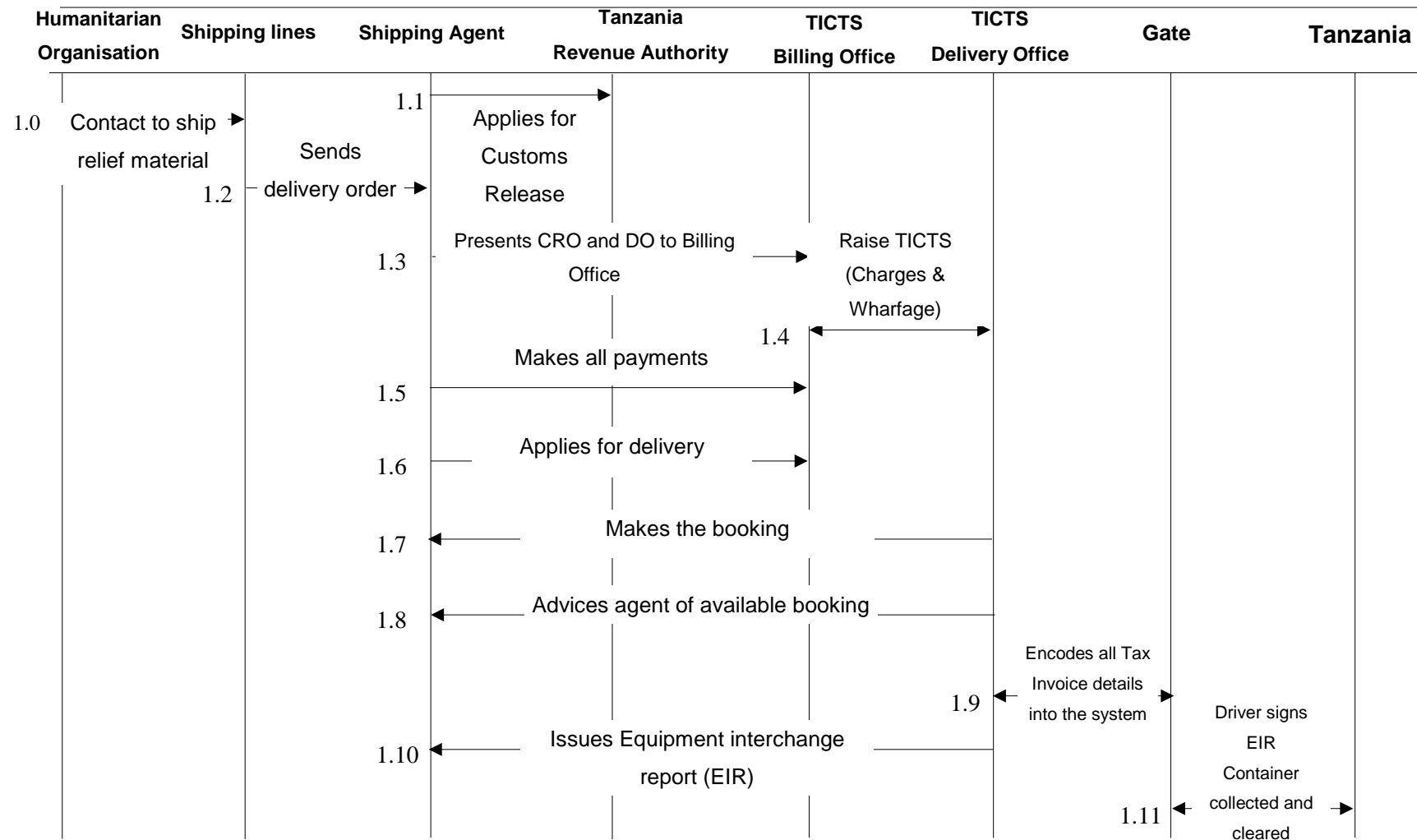
In Figure 6.2, the supply chain starts from the humanitarian organisation. The shipping agent represents the humanitarian organisation in terms of clearing the cargo at the Tanzania International Container Terminal. The shipping agent may also act as the clearing agent. The clearing agent must obtain the customs release order (CRO) from the Tanzania Revenue Authority (TRA). The TRA issues the customs release order. The shipping agent presents the CRO and the delivery orders (DO) to the Tanzania International Container Terminal Billing (TICTS) office. The TICTS billing office will verify the documents vis à vis the electronic version and the delivery details obtained from the shipping lines. The TICTS will then invoice the clients for the charges as well as wharfage. The agent must settle all the charges at the TICT's cash office.

After the payment has been made, the agent takes the proof of payment to make a delivery booking. The agent takes the tax invoice to the delivery office. The TICTS delivery office verifies the documents before advising the agent of the available booking slots.

The delivery office encodes all the tax invoice details, the agent's Identity number, truck and driver particulars into the system to produce an Equipement Interchange Report (EIR). The EIR is handed to the agent to allow the truck to enter into the port and pick up the relief container at the specified time.



## Tanzania: TICT



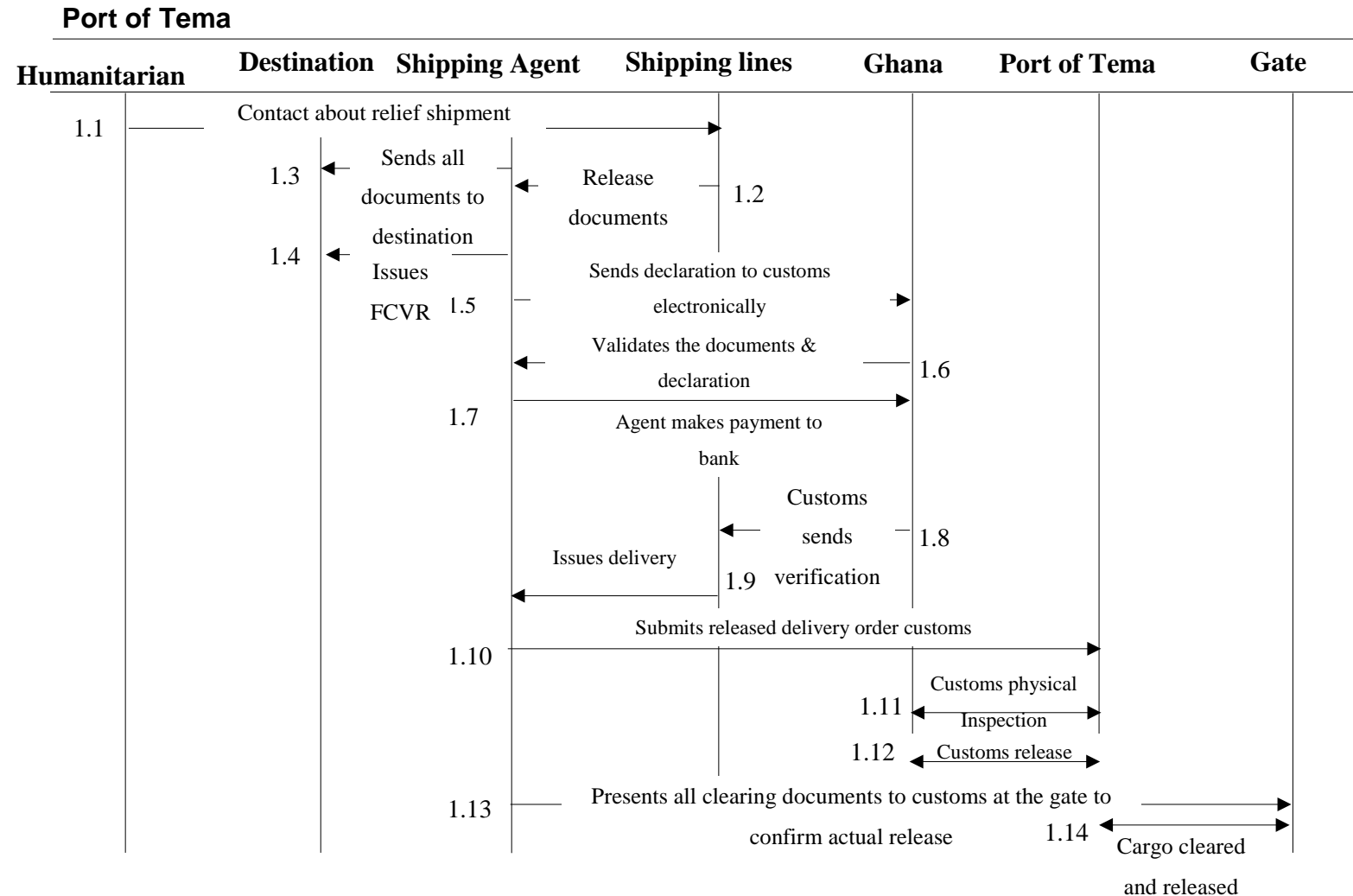
**Figure 6.2 Tanzania: TICT**

Source: Author, 2014

In Figure 6.3, the supply chain starts from the humanitarian organisation. The shipping line brings in the relief container and gives the shipping agents the notable invoice, packing list and freight receipt. The shipping agent represents the humanitarian organisation in terms of clearing the cargo at the Port of Tema. The shipping agent sends all the documents to the destination inspection agents. The documents are authenticated by the destination inspection company, who issue the final classification and valuation report (FCVR).

The FCVR is sent to customs management systems electronically. Ghana's customs also verify the documents and authenticate them by ensuring that the proper dues are paid. The agents make payment at a Ghanaian commercial bank. After payment has been made, the agent attaches the following documents: a bill of lading, attested invoice, import declaration form (IDF) and FCVR, and sends them to customs for verification. This set of documents is also sent to the shipping lines for the cargo to be released. After all administrative charges have been paid, the delivery order is issued by the shipping lines and given back to the agent.

All documents are submitted to the shore handling provided at the port and any applicable additional charges (handling charges, rent, unstuffing) are paid. After this the agent proceeds to the delivery bay for the cargo to be located and positioned for customs to perform physical inspection or scanning. The cargo will be released if there is no variation with all the information in the declaration and physical inspection.

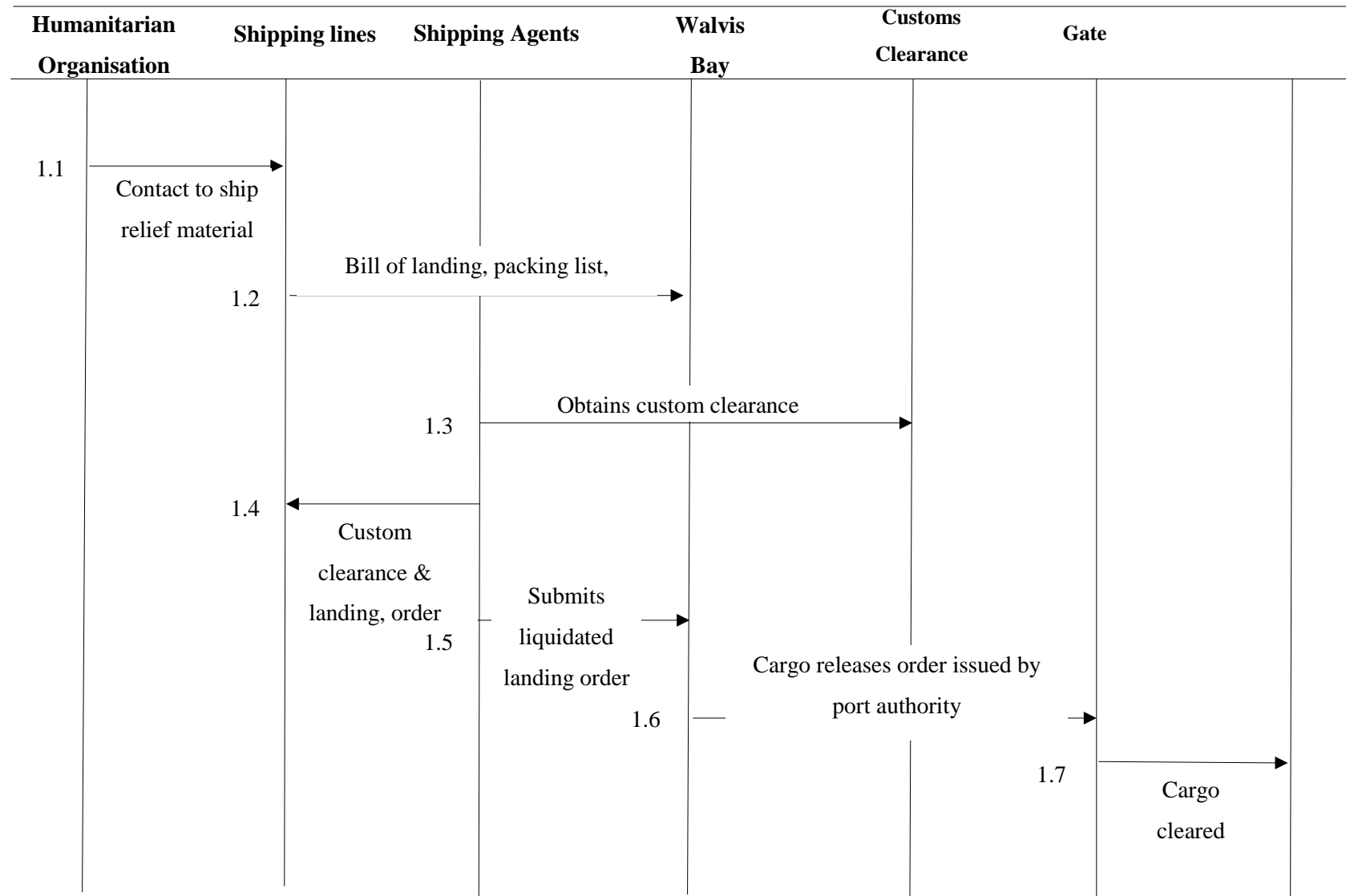


**Figure 6.3 Port of Tema**

Source: Author, 2014

In Figure 6.4, the supply chain starts from the humanitarian organisation. The shipping line sends the following documents: original commercial invoice, packing list and bill of lading to the Port of Walvis Bay. The shipping agent then obtains the custom clearance. The customs clearance and landing order are submitted to the shipping line. The shipping line submits the liquidated landing order to the port. The cargo release order is issued by the Port Authority. The cargo is then cleared from the port.

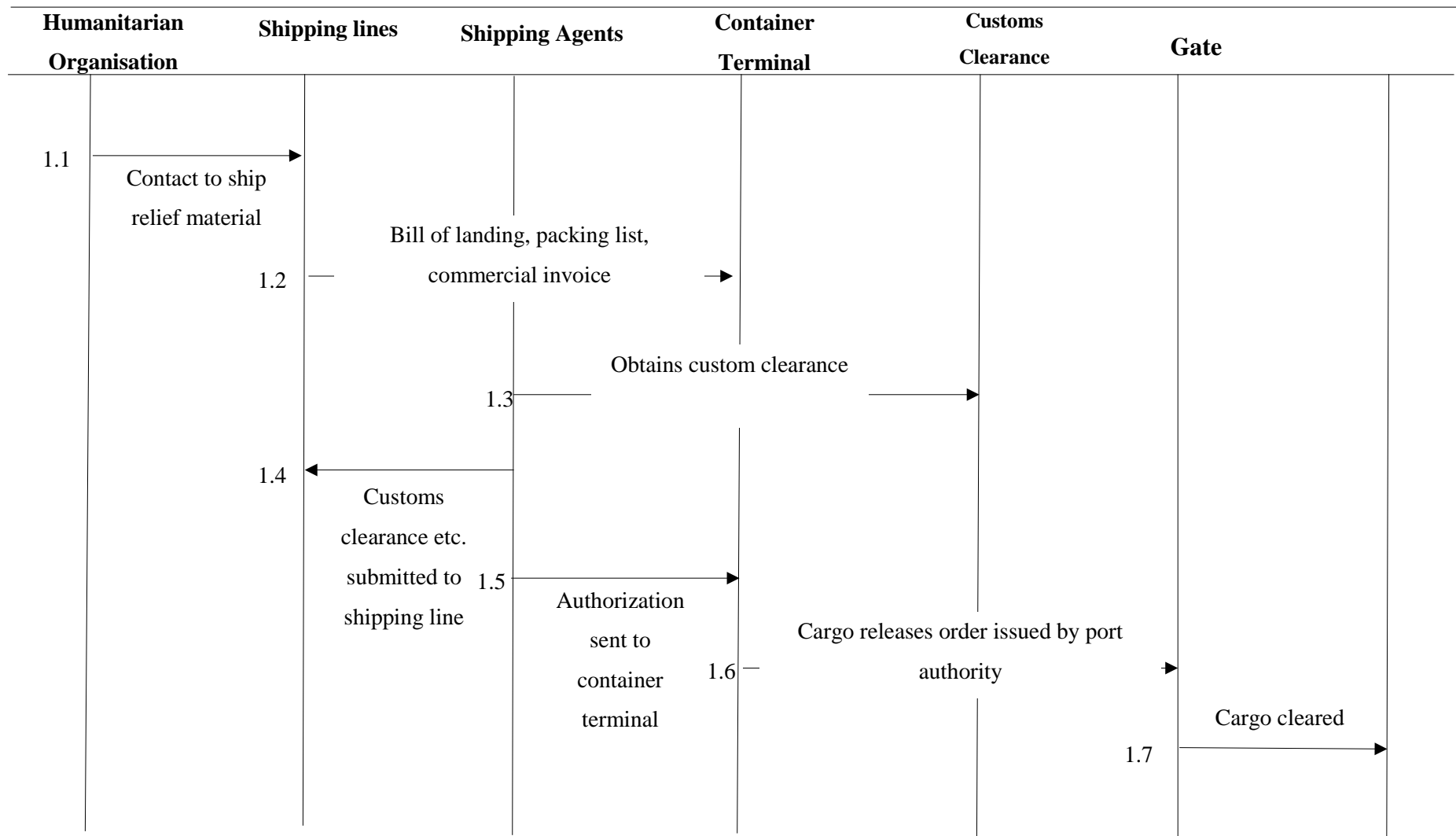
# Walvis Bay Container Terminal



**Figure 6.4 Walvis Bay Container Terminal**

Source: Author, 2014

Figure 6.5 is the generic import document flow. The humanitarian organisation contacts the shipping lines. The shipping line contacts the shipping agents, who submit the important basic documents such as the commercial invoice, packing list and the bill of lading to the customs as well as to the container terminal. The customs issue a custom clearance, which is submitted to the shipping line. After all documents are verified and authenticated by the ports and customs. Finally, the container is cleared.



**Figure 6.5 Generic Import Document Flow**

Source: Author 2014

## **6.8 Responsibilities of role players**

The guideline provides the role players (see below) with all the necessary information that is required for the successful flow of the supply chain of the relief materials:

- humanitarian organisation
- container shipping lines and freight forwarding companies
- ports

### **6.8.1 Humanitarian organisations**

Humanitarian organisations provide relief materials for victims of natural disasters and conflict in emergency situations. Relief materials can be in the form of food and non-food items.

#### **6.8.1.1. Nature of relief materials**

The humanitarian organisation must inform the shipper of the destination of the shipment. Since most relief materials are emergency-oriented, the humanitarian organisation must inform the shipping company that the shipment is urgent and state the purpose of the shipments.

#### **6.8.1.2. Special requirements**

The humanitarian organisation must inform the shipper of any special requirements that must be observed with regards to the transportation of the shipment.

It is important for humanitarian organisations that the shipments are safe and secure. The shipping company must put measures in place to deter theft of and damage to the relief materials.

#### **6.8.1.3 Information technology**

The humanitarian organisation needs to be able to track the shipment from the shipper to the destination. The humanitarian organisation must be given a track and trace number to ensure monitoring of the shipment.

#### **6.8.1.4 Consignee**

The humanitarian organisation must give the shipping company the name of the contact person who will collect the relief shipment at the destination.

#### **6.8.1.5 Warehousing**

It may be necessary for the shipment to be stored in a warehouse. The humanitarian organisation must state if they want to make use of this facility.



## **6.8.2 The shipping company**

Relief shipments are transported by container ships. This is because large volumes of relief shipments can be transported by sea and they are cost effective. The shipping company must inform the container terminal of the following:

### **6.8.2.1 The type of shipment**

This is an emergency container shipment laden with relief materials for natural disasters and conflict. The shipping company must inform the port that the container is a 'hot box'. 'Hot box' means containers that need to be urgently cleared.

### **6.8.2.2 Characteristics of vessel**

Usually the name, type and characteristics of the vessel need to be mentioned. The shipper must also state if the vessel has cargo-handling equipment on board or not. The vessel's dimensions in terms of draught, overall length, etc. must be mentioned. Some vessels are too large to enter the port and as a result it may be necessary for the vessel to be offloaded by barges.

### **6.8.2.3 The quantity of TEUs:**

The shipper must state not only the number of containers that are laden with the emergency materials, but also the type of containers e.g. 20 ft. or 40 ft.

### **6.8.2.4 The stowage plan:**

The shipper must state on the stowage plan where the containers are stowed on the ship. This enables the containers to be offloaded with ease.

### **6.8.2.5 Navigational guides**

The shipper must inform the port if it needs navigational guides to lead the vessel into the ports. This is because some of the ship's captains are not familiar with the coastal ways and as a result need a tugboat to guide them into the port to prevent the vessel from running aground.

### **6.8.2.6 Expected time of arrival and expected time of departure**

The shipper must provide the port with information on the vessel's expected times of arrival and departure. Also, if there is any deviation from the ETA and ETD, the shipper must inform the port.

### **6.8.2.7 Transshipment**

The shipper must inform the ports if there are some containers that will be transhipped to other neighbouring ports.

### **6.8.2.8 Service level agreement**

The shipping company must inform the ports if they have any prior berthing agreements. Service level agreements may facilitate the efficiency of the service.

**6.8.2.9 Warehousing**

The shipping company must inform the port if they will make use of the port's warehouse facilities.

**6.8.2.10 Communication**

The shipping company needs to be able to track the shipment immediately after it arrives at the port. The shipping company must be able to have access to the port's terminal operating system to track and trace the shipment.

**6.8.2.11 Documentation**

The shipping company must send the required documents, namely, a bill of lading, cargo list, stowage plan, etc. to the port.

**6.8.3 Information from the humanitarian organisation**

The shipping company requires the following information from the humanitarian organisation:

**6.8.3.1 Booking a container**

This can be done electronically.

**6.8.3.2 Shipping instructions**

This includes important information such as: a booking number, commodity, type of transport document (negotiable bill of lading), type and number of packages, invoicing details, and place of receipt, discharge and delivery.

**6.8.3.3 Consignee**

The consignee is the person named on the bill of lading who will take over the consignment at the port of destination. Parties involved and contact details (e-mail address, phone numbers and fax numbers) are required.

**6.8.3.4 Exact destination**

The humanitarian organisation must specify the exact destination of the shipment.

**6.8.3.5 Rates**

When the destinations have been established, it is possible to determine the cost of transportation. However, based on the importance and urgency of the relief materials there will usually be an opportunity for negotiations.

**6.8.3.6 Type of goods or equipment**

The type of goods must be made known to the shipping company to allow for proper packing and stowage of the shipment.

**6.8.3.7 Special care required**

The humanitarian organisation must state if any of the shipment needs any special care or requirements, e.g. refrigeration, labelling or handling.

**6.8.3.8 Condition of shipment**

The humanitarian organisation must state the condition of the shipment before it is shipped. This will prevent insurance claims in the future.

**6.8.3.9 Container size and type**

It is important for the humanitarian organisation to specify the container size, i.e. 20 ft. or 40 ft.

**6.8.4 The ports and terminal operators**

The shipping company and the humanitarian organisation require the following information from the port and terminal operators:

- Size of vessels that the container terminal can accommodate
- Tariffs and dues
- Ship-to-shore productivity that is container moves per gross crane hour
- Environmental impacts such as wind, ice, noise, light and snow
- Connection to the hinterland transport modes of road, railway and inland waterways
- Authorising officials

To avoid confusion, the shipping company needs to know the authorising officials, for instance, the port official who should be contacted in case there is any problem with the shipment.

**6.8.4.1 Rules and regulations**

The ports need to give the shipping company its rules and regulations to ensure compliance.

**6.8.4.2 Vessel position reports**

The port should inform the shipping company and the humanitarian organisation when the vessel arrives at the berth.

**6.8.4.3 Preferential treatment**

The port needs to state if it offers preferential treatment, for example, in terms of berthing or tariff discount for relief materials.

**6.8.4.4 Equipment**

The port should state if it has cargo-handling equipment for the discharge of the vessel. Some ports do not have cargo-handling equipment and as a result may have to use the cargo-handling equipment on board the vessel.

**6.8.4.5 Warehousing**

The port should state if there is availability of warehouse facilities it is also important to state whether there is availability of pallets to store goods and whether the warehouse is fumigated. The port should also state if there are plastic pallets available. This is because these are most suitable for medical relief materials. Sometimes the mould on the wooden pallets may affect the quality of the medical relief materials. The port should also state what the cost of the warehouse facility is to the user.

**6.8.4.6 Terminal operating system**

The shipping company and humanitarian organisation must have access to the port's terminal operating system. From the portal the shipping company and the humanitarian organisation must be able to track and trace the shipment through the track and trace number that is generated by the system.

**6.8.4.7 Safety and security**

The port should state what safety and security measures they have put in place in the port to prevent theft of and damage to the consignment.

**6.8.4.8 Documentation**

All documents required for the effective flow of the supply chain must be sent through the port's terminal operating system. The port should state the appropriate time this document needs to be sent to the port.

**6.8.4.9 Delays**

The port should inform the stakeholder of any delay that may occur. This delay could be strike action, wind, power outage, etc.

**6.8.4.10 Berthing requirements**

The port should state what the berthing requirements are, i.e. whether it is on a first come, first served basis, or whether it is berthing based on a service level agreement with shipping lines and freight forwarding companies.

**6.8.4.11 Stacking area**

The port needs to give the shipping company and humanitarian organisation the relevant stacking area number. It is also important to state when the stacking areas are closed and when they are opened.

**6.8.4.12 Gang availability**

The gang is the manpower that will be working on the vessel. The shipping company and humanitarian organisation must state the number of people that will work on the vessel and how long it will take.

### 6.8.4.13 Rates and tariffs

Port rates and tariffs must be made known to the shipping company and the humanitarian organisation so that payment will be made.

### 6.8.4.14 Customs

The shipping company must adhere to the customs rules and regulations so that the shipment is finalised for clearing.

## 6.9 Checklists

### 6.9.1 Relief container checklist for ports

This checklist is to help port officials to tick off and comment on any aspect of the vessel that is about to berth. It also enables the port user to be aware of issues relevant to the shipment of relief materials at a glance. This is shown in Table 6.3.

**Table 6.3 Relief container checklist for ports**

**Port:**

**Location:**

Port				Time	
Urgent shipment	Y	N	Vessel arrived	Y	N
Preferential treatment	Y	N	Vessel cleared	Y	N
Aware of any special instruction	Y	N	Any major delay	Y	N
Adhered to special instruction	Y	N			
Warehousing			Resources		
Warehousing required	Y	N	Availability of berth	Y	N
Fumigation required	Y	N	Availability of equipment	Y	N
Pallets to store the goods needed	Y	N	Availability of stacking area	Y	N
Security available	Y	N	Availability of storage	Y	N
Documentation			Payments		

All documents sent electronically	Y	N	Port dues and charges made	Y	N
All documents received	Y	N	Customs duties made	Y	N
All documents correct	Y	N			
<b>Others</b>					
Surveys required	Y	N	Special rates	Y	N
			Penalties	Y	N
<b>Comments</b>					

Source: Author, 2014

## 6.9.2 Relief container checklist for a container shipping line or freight forwarding company

This checklist is for the shipping lines and freight forwarding companies. It provides them with important information that relates to their cargo at the port. This is shown in Table 6.4.

**Table 6.4 Relief container checklist for container shipping line or freight forwarding company**  
**Container Shipping line or freight forwarding:** **Location**

Shipping company			Port		
Vessel name			All port documentation sent	Y	N
Vessel arrival time noted	Y	N	All customs documentation sent		
Vessel type noted	Y	N	Documents sent electronically prior to the stipulated time	Y	N
Vessel departure time noted	Y	N	Berthing arrangements made	Y	N
Number of “hot containers” (emergency) noted	Y	N	Cargo-handling equipment arrangements made	Y	N
Stowage of “hot container” noted	Y	N	Gang arranged	Y	N
Transshipment needs noted	Y	N	<b>Documents</b>	Y	N

Type of relief materials noted	Y	N	Electronic and hard copy sent	Y	N
<b>Shipping instructions</b>			Bill of lading	Y	N
Handling requirements mentioned to the port	Y	N	Commercial invoice	Y	N
Packaging requirements mentioned to the port	Y	N	Packing list	Y	N
Other special requirements mentioned to the port	Y	N	Other documents required	Y	N
<b>Payments</b>			<b>Transportation requirements</b>		
Port dues and charges noted and paid	Y	N	Trucks	Y	N
Custom dues and charges noted and paid	Y	N	Rail	Y	N
Shipping charges paid	Y	N	Short sea shipping	Y	N
<b>Vessel cleared on time</b>	Y	N			
<b>Comments</b>					

Source: Author, 2014

### 6.9.3 Relief container checklist for humanitarian organisations

This checklist is for the humanitarian organisations. It provides them with important information that relates to their cargo at the port. This is shown in Table 6.5.

**Table 6.5 Relief container checklist for humanitarian organisations**

**Humanitarian organisation:**

**Location:**

Humanitarian organisation			Relief shipment		
Contact shipping line and inform of relief shipment	Y	N	Special instructions sent to shipping line	Y	N
Contact shipping agent if they are different from the shipping line	Y	N	Special instructions to shipping agent		
Confirm that the shipping line has contacted the ports	Y	N	Inco term agreed on with the shipping line	Y	N
Confirm that the ports are aware of the urgency with	Y	N	Information on the type of relief materials sent to shipping company	Y	N

regard to this relief shipment					
Confirm ETA	Y	N	Information on the country of destination sent to the shipping company	Y	N
Shipping company			The purpose of the relief shipment sent to the shipping company	Y	N
Humanitarian representative in the destination country contacted	Y	N	Preferential treatment need sent to the shipping company	Y	N
All necessary information about the disaster and urgency sent to the shipping company	Y	N	Port		
Assigned personnel to the shipment communicated with	Y	N	Instructions for the port communicated through the shipping company	Y	N
Track and trace number of the shipment known	Y	N	Information on contact person at the port destination sent to the shipping line	Y	N
			Transportation options		
			Special transportation need communicated to the shipping company	Y	N
Payment options					
All payment made to shipping company	Y	N			
Relief shipment arrives at destination on time	Y	N			
Comments					

## 6.10 Conclusion

This guide is aimed at enabling the port users and Port Authorities to expedite action on the maritime supply chain of relief materials. It is intended to prevent any form of information or communication confusion. It aims to allow the actors in the maritime sector to address the issue of delays and waste at a critical level.



## **CHAPTER 7: CASE STUDY TESTING THE GUIDELINE AT THE PORT OF DURBAN CONTAINER TERMINAL**

### **7.1 Introduction**

The guideline for handling relief materials is aimed at the maritime stakeholders that make use of the Port of Durban. It is aimed at reducing the cargo dwell time of relief shipment at the Port of Durban. This section introduces how the guideline was tested at the Port of Durban.

### **7.2 Clearing of an emergency container**

This chapter focuses on the process of clearing an emergency container. The representative of World Vision International (WVI) was contacted and the need to test the guideline developed in order to help reduce the cargo dwell time at the Port of Durban was explained. The researcher was informed that the vessel MV Maersk Elgin would be arriving at the Port of Durban on 29th September 2014. It was to be laden with a shipment of Corn Soy Beans that would be arriving at the Port of Durban en-route to Zimbabwe. This was because of the humanitarian situation in Zimbabwe.

World Vision International, through its team had done the needs assessment to determine what was actually needed. In this case food was urgently needed in Zimbabwe. Due to the fact that Zimbabwe is land locked the shipment has to be routed through the Port of Durban.

WVI contacted the shipping agent, in this case SDV-Bollere. To send the container shipment of relief material-food, SDV-Bollere, on behalf of WVI, booked a space on MV Maersk Elgin. The vessel was expected to arrive at the Port of Durban on September 2014.

The process of clearing containers at the Port of Durban depends on the type of relief cargo concerned. The shipping line needed to inform the Port of Durban that the MV Maersk Elgin was loaded with containers for humanitarian purposes. In order to reduce the cargo dwell time, the documentation needed had to be sent before the MV Maersk Elgin berthed at the Port of Durban. All documents were submitted electronically via the Navis SPARCS system.

Prior to the vessel arriving at the Port of Durban, the shipping line sends an Arrival Notification Form (ANF). This informs the Port of Durban as well as the agent of the arrival of the vessel. All concerned parties are notified, with daily updates provided regarding the vessel.

In order to clear the emergency container at the Port of Durban, the importer's code is required. It takes three weeks for the importer's code to be issued by SARS. The DA185 form is used to apply for the importer's code. The documentation required is the following:

### **7.2.1 Customs Code of Instructions**

This is a legal requirement by SARS that states that importers are required to give written instructions to their agents.

### **7.2.2 Importer's code**

This is an important SARS requirement for importing anything into South Africa.

### **7.2.3 Bill of lading**

The bill of lading is the document that shows who owns the cargo by indicating the name and address of the receiver. It describes the cargo in terms of quantity and content of containers and also shows the vessel that will carry the cargo.

### **7.2.4 Supplier commercial invoice**

This document is required by SARS. It should state the true value of the imported goods. This is to assist in determining the duties and taxes. The commercial invoice must identify the buyer and sellers, determine the date and terms of sale, state the quantity weight and volume of the shipment and type of packaging, provide a complete description of the goods unit value and total value of the shipments and of the insurance, shipping and other charges.

### **7.2.5 Packing list**

This describes the list of goods in detail. This list must also correspond with what is stated on the bill of lading and the commercial invoice. The packing list must include the number, description, weight in metric tons, length in metres, width in metres, height in metres and the cubic measurement of all the packages.

### **7.2.6 Certificate of origin**

This is for containers imported from in European countries.

### **7.2.7 Port health certificates or plant inspection certificates**

These certificates are issued after foodstuffs are monitored and evaluated.

### **7.2.8 Descriptive literature**

This describes the transaction dynamics between the clearing and forwarding agent and the shipper.

### **7.2.9 Certificate of donation**

A certificate of donation is a letter written by the humanitarian organisation stating that the relief materials are for humanitarian purposes. This helps to process exemptions for duties and tax purposes.

### **7.2.10 Manifest**

The manifest shows the list of all the cargo on board. This includes the actual weight as well as the volumetric weight. This gives a detailed summary of all bills of lading.

### **7.2.11 Delivery orders**

These are a written directive from the shipper of the shipment to the carrier of the shipment to release the shipment to a named delivery party.

### **7.2.12 Clearing instructions**

This comprises a set of instructions indicating the shipping agent. The documents include the following:

- importer's details
- required documents (negotiable bill of lading, copy of indent, packing list, certificate of origin, supplier's invoice, etc.)
- marine insurance
- import permit

Once the vessel has arrived, all landside charges must be paid. After which, customs will release the containers, if there are no problems. The agent is contacted and requested to collect the container to deliver it to the customer. If there is a customs stop, the container needs to be taken to the shipping line premises, where the inspection will take place.

## **7.3 Customs stop**

Delays may occur as a result of customs stops. These occur when customs want to verify the contents of a shipment. Customs will stop a shipment if there are discrepancies between the information supplied via the system and the hard copy information. There are two types of customs stops.

- Paper stop: Goods are allowed to move, but customs need to inspect the paper work
- Shipment stop: Customs actually inspect the goods

In the case of this particular shipment there was no customs stop.

## 7.4 Port of Durban documentation requirements for the Clearing of MV Maersk Elgin

Relief materials sent to victims of natural disasters encompass a list of items that are required. The documentation also varies according to the relevant relief materials. The list of documents required for the clearing of various types of relief materials is shown in Table 7.1. All relief materials require the same set of documentation, with the exception of food, medicines, agricultural products and livestock, hazardous goods, information technology gadgets and security items, which require special permits.

**Table 7.1 Documentation required for relief materials**

Commodity	Documentation required	Comments
Food-Corn Soya Based Meal	Original Bill of lading Release Letter Commercial invoice Packing list Certificate of origin Importation permits as required EUR 1 certificate KC156 Clearing instruction Certificate of Donation Plant certificate Biosafety import permit Rebate letter	Food will be checked by port health authority.
Medicines	As above	Medicines will be checked by the port health authority.
Clean water kits	As above	Special permits are required and are subject to import control.
Cooking sets and household items	As above	Not applicable
Shelter kits: tents and tarpaulins	As above	Not applicable
Construction materials and tools	As above	Not applicable
Agriculture and livestock	As above	State veterinary permits and agriculture permits.
Hazardous goods	As above	Dangerous goods certificate

Information technology gadgets	As above	NRCS (National Regulatory Council of South Africa) letter of authority
Security items: bullet- proof vests	As above	Special permits are required and are subject to import control
Books, toys, bicycles and shoes	As above	Not applicable

Source: Author, Field work March 2014

#### 7.4.1 Rebate of duty and taxes

The International Trade and Administration Commission of South Africa is responsible for the exemption of tax and duties for humanitarian shipments. However, certain documents are required to be submitted by the shipping agents on behalf of the humanitarian organisation before this exemption can be granted. According to ITAC (2014), the following are the required documents:

- Copy of the organisational constitution
- Copy of registration certificate as a non-profit organisation in terms of the Non-Profit Organisations Act, if applicable
- Confirmation letter and invoices from the donor
- Two references of third parties who can vouch for bona fide activities of the organisation

#### 7.5 Guidelines for the various stakeholders

Table 7.2 summarises the principles that should assist the maritime stakeholders in the operation and discharge of relief shipments. The adoption of these principles assists in reducing cargo dwell time at the Port of Durban.

**Table 7.2 Guidelines for the various stakeholders**

Principle	Port	Shipping company	Humanitarian organisation
Strategic planning	Strategic planning for the expansion of container terminals; warehousing; cargo- handling equipment and training of personnel. Assigning the personnel or team that will work in an emergency scenario.	Strategic planning in order to expedite the process. Knowledge of who to contact in the Port of Durban. Assigning the team that will work in an emergency scenario.	Strategic planning as to the shipping company and ports that will deliver the shipments expeditiously. Assigning the team that will follow up on the shipment at the Port of Durban regarding origin and destination.
Set procedures to	Proper procedure for	The team should know the	Awareness and knowledge of

abide by	handling relief materials. Personnel should be trained to understand and implement procedures for handling relief materials.	port procedures	port procedures and practices
Proper documentation	The required documentation for the clearing of relief cargo must be clear and without ambiguities. Avoidance of errors Avoidance of missing documents	Compliance with the necessary documentation. Avoidance of submitting the wrong information Monitoring of all documents submitted Having back-up documents	Proper documentation of all information needed for the expeditious delivery of relief materials
Communication	All the key port officials should be well informed of the shipment of relief cargo. The information should be passed on to all the stakeholders. If there is a problem at the Port of Durban, for example strike action, this should also be communicated to the shipping company. The Port of Durban should ensure that in all situations the shipment can be tracked and traced in real time.	Integration of information. Informing the Port of Durban's of the expected time of arrival The humanitarian organisation must be informed of the status of the shipment.	Free flow of information between the stakeholders with regard to the shipment
Setting the standards	The paperwork, forms and application process should be uniform. The process and procedure that need to be activated during emergency should be uniform in all the Port of Durban's branches.	Conforming to the prescribed standards of the Port of Durban Also ensuring that the Port of Durban is aware of the shipping company's standards and practices.	Conformity with the Port of Durban's standards and with the fact that the shipping company is aware of the humanitarian organisation's expectations and standards

	<p>The paperwork should be simple to understand and not be too lengthy.</p> <p>The standards should not be compromised and should be known and acceptable to all the stakeholders, for example, when demurrage is charged.</p>		
Test	<p>The Port of Durban should ensure that all the cargo- handling equipment is in good order. If possible, the Port of Durban should carry out emergency drills.</p>	<p>Testing the assigned employees to determine their knowledge of the Port of Durban and its procedures.</p>	<p>Testing the level of compliance among the staff regarding the Port of Durban's procedures and practices.</p> <p>Ensuring that the humanitarian organisation team is aware of the Port of Durban's processes and procedures</p>
Maintenance	<p>Proper maintenance of all machines and equipment</p>	<p>Ensuring that the trucks to be used to transfer the containers are in good condition</p> <p>Relationship with humanitarian organisation must be professionally maintained.</p>	<p>All tools should be well maintained.</p> <p>Relationship with donors ought to be maintained.</p>
Local Involvement	<p>Need to involve casual labour if the need arises.</p>	<p>If necessary, there may be a need to involve local expertise in order to expedite the process.</p>	<p>If necessary, local labour and expertise may be implemented for effective delivery.</p>
Back-up	<p>There should be a Plan B (alternative plan) if there is a problem with the original plan.</p>	<p>Need to have a Plan B if the Port of Durban is not able to perform due to unforeseen circumstances.</p>	<p>Need to have an alternative plan if the present plan seems to be failing.</p>
Collaboration	<p>Need for collaboration with other port authorities in order to improve.</p>	<p>Need to collaborate effectively with officials at the Port of Durban</p>	<p>Need to collaborate with officials of the Port of Durban as well as the shipping company officials.</p>
Feedback	<p>There should be a forum for feedback among the</p>	<p>There should be a forum for feedback among the</p>	<p>There should be a forum for feedback. This will enhance</p>

	stakeholders.	stakeholders and a means of improvement on the practices.	improvement.
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Source: Author, June 2013

## 7.6 Information flow for the Port of Durban

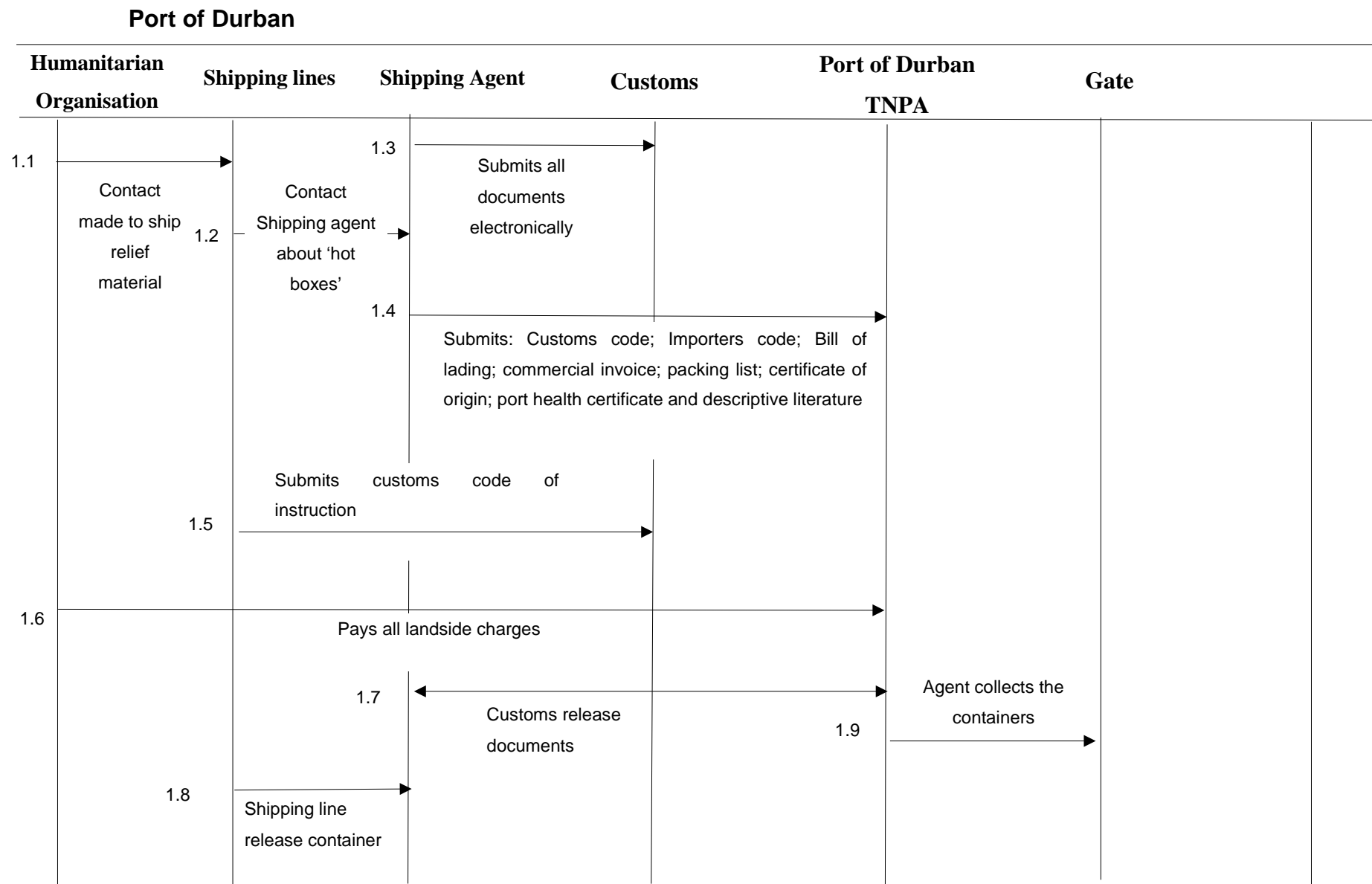
This section deals with the line of action followed, especially among the stakeholders. The stakeholders include the importer (humanitarian organisation), the shipping line, customs, trucking company, container port and, if necessary, the agent. After the occurrence of a natural disaster, the humanitarian organisation makes its intention of shipping relief materials to the specified destination in Sub-Saharan Africa known to the shipping company. The shipping company then informs the Port of Durban of the origin and the destination for the shipment of relief materials. The Port of Durban activates the plan of action based on all the information received from the humanitarian organisation and the shipping company. Each of the stakeholders has a line of action that needs to be activated to expedite the supply chain of relief materials.

The representative of the humanitarian organisation (importer) needs to have obtained an import permit, the container needs to be customs cleared, the shipping line freight charges need to have been paid and the container port cargo dues need to have been processed before the shipping line will release the container. The importer has a choice of using “carrier haulage”, where the shipping line is responsible for the cargo from the origin packing station to the destination delivery station including providing landside transport and effecting the customs clearance on behalf of the importer, or can use “merchant haulage”, where a clearing and forwarding agent is contracted to provide the landside transport at both ends, effecting customs clearance on their behalf, and the shipping line is only responsible for the sea-passage of the container.

The Port of Durban system is automated. The Port of Durban will get involved once the container has been released by the shipping line and a trucking company has been assigned to collect the container. All the Port of Durban’s dealings in the discharging of the container are with the shipping line only. The shipping company and humanitarian organisation are able to track and trace their shipments electronically.

After the whole operation is completed, the stakeholders ought to be able to give feedback to one another in order to track their performance and to be able to improve in the areas where there may be deficiencies or lapses. This means that these operations need to be well documented. Figure 7.1 describes the process and how the information flow works.





**Figure 7.1 Port of Durban: Import document flow**

Source: Author, June 2013

## 7.7 Checklists for the Port of Durban

### 7.7.1 Relief container checklist for ports

This checklist is to help the Port of Durban officials to tick off and comment on any aspect of the vessel that is about to berth. It also enables users of the Port of Durban to be aware, at a glance, of issues relevant to the relief shipment (See Table 7.3). Table 7.3 was tested by the Port of Durban on the MV MAERSK ELGIIN.

**Table 7.3 Relief container checklist for ports**

**Port:**

**Location:**

Port of Durban				Time 29 <sup>th</sup> September 2014	
Urgent shipment	<u>Y</u>	N	Vessel arrived	<u>Y</u>	N
Preferential treatment	Y	<u>N</u>	Vessel cleared	<u>Y</u>	N
Aware of any special instruction	<u>Y</u>	N	Any major delay (Bad Weather)	<u>Y</u>	N
Adhered to special instruction	<u>Y</u>	N			
Warehousing			Resources		
Warehousing required	Y	<u>N</u>	Availability of berth	<u>Y</u>	N
Fumigation required	Y	<u>N</u>	Availability of equipment	<u>Y</u>	N
Pallets to store the goods needed	Y	<u>N</u>	Availability of stacking area	<u>Y</u>	N
Security available	<u>Y</u>	N	Availability of storage	Y	Not Required
Documentation			Payments		
All documents sent electronically	<u>Y</u>	N	Port dues and charges paid	<u>Y</u>	N
All documents received	<u>Y</u>	N	Customs duties paid	<u>Y</u>	N
All documents correct	<u>Y</u>	N			

<b>Others</b>					
Surveys required	<u>Y</u>	N	Special rates	Y	<u>N</u>
			Penalties	Y	<u>N</u>
Comments	Use of 2 Gangs for 36 hours				

Source: Author, October 2014

### 7.7.2 Relief container checklist for shipping company

This checklist is for the shipping lines and freight forwarding companies. It allows them to gain important information that relates to their cargo at the Port of Durban (See Table 7.4). Table 7.4 was used as the template to test the compliance of the SDV-Bollore to the requirements to clear the shipment from the port.

**Table 7.4 Relief container checklist for shipping company**

**Shipping company:**

**Location:**

Shipping company		Maersk Shipping/ SDV-Bollore	Port		Port of Durban
Vessel name	MV MAERSK ELGIN		All port documentation sent	<u>Y</u>	N
			All customs documentation sent	<u>Y</u>	N
Vessel arrival time noted	<u>Y</u>	N	Documents sent electronically prior to the stipulated time	<u>Y</u>	N
Vessel type noted	<u>Y</u>	N	Berthing arrangements made	<u>Y</u>	N
Vessel departure time noted	<u>Y</u>	N	Cargo handling equipment arrangement made	<u>Y</u>	N
Number of 'hot containers' noted	<u>Y</u> <u>63</u>	N	Gang arranged	<u>Y</u>	N
Stowage of hot container noted	Y	<u>N</u>	<b>Documents</b>	<u>Y</u>	N
Transshipment needs noted	<u>Y</u>	N	Electronic and hard copy sent	<u>Y</u>	N
Type of relief materials	<u>Y</u>	N	Bill of lading	<u>Y</u>	N

noted					
<b>Shipping instructions</b>			Commercial invoice	<u>Y</u>	N
Handling requirements mentioned to The Port of Durban	<u>Y</u>	N	packing list	<u>Y</u>	N
Packaging requirements mentioned for the Port of Durban	<u>Y</u>	N	Other documents required	<u>Y</u>	N
Other special requirements mentioned for the Port of Durban	<u>Y</u>	N	Transportation requirements		
<b>Payments</b>					
Port dues and charges noted and paid	<u>Y</u>	N	Trucks	<u>Y</u>	N
Custom dues and Charges noted and paid	<u>Y</u>	N	Rail	<u>Y</u>	N
Shipping charges paid	<u>Y</u>	N			
<b>Vessel cleared on time</b>	<u>Y</u>	N	Short sea shipping	Y	<u>N</u>
<b>Comments</b>					

Source: Author, October 2014

### 7.7.3 Relief container checklist for humanitarian organisation

This checklist is for the humanitarian organisation. It allows them to gain important information that relates to their cargo at the Port of Durban (See Table 7.5). Table 7.5 was tested on the maritime stakeholders SDV-Bollere, WVI and the Port of Durban).

**Table 7.5 Relief container checklist for humanitarian organisation**

**Humanitarian organisation:**

**Location:**

Humanitarian organisation		USAID/WVI	Relief shipment		
Contact shipping line and inform of relief shipment	<u>Y</u>	N	Special instructions sent to shipping line	<u>Y</u>	N
Contact Shipping agent if they are different from the shipping line	<u>Y</u>	N	Special instruction to shipping agent		
Confirm that the shipping line has contacted the Port of Durban	<u>Y</u>	N	Inco Term agreed on with the shipping line	<u>Y</u>	N
Confirm that the Port of	<u>Y</u>	N	Information on the type of relief	<u>Y</u>	N

Durban’s officials are aware of the urgency with regards to this relief shipment			materials sent to shipping company		
Confirm ETA	<u>Y</u>	N	Information on the country of destination sent to the shipping company	<u>Y</u>	N
Shipping company			The purpose of the relief shipment sent to the shipping company	<u>Y</u>	N
Humanitarian representative at the destination country contacted	<u>Y</u>	N	Preferential treatment needed sent to the shipping company	<u>Y</u>	N
All necessary information about the disaster and urgency sent to the shipping company	<u>Y</u>	N	Port		
Assigned personnel for the shipment communicated with	<u>Y</u>	N	Instructions for the Port of Durban communicated through the shipping company	<u>Y</u>	N
Track and trace number of the shipment known	<u>Y</u>	N	Information on contact person at the Port of Durban destination sent to the shipping line	<u>Y</u>	N
			Transportation options		
			Special transportation needed communicated to the shipping company	<u>Y</u>	N
Payment options					
All payment made to shipping company	<u>Y</u>	N			
Relief shipment arrives at destination on time	<u>Y</u>	N			
Comments					

Source: Author, October 2014

## 7.8 Testing

This section aims at testing the effectiveness of the guideline, using certain parameters that are relevant to the supply chain of relief materials. The parameters are: information, communication, speed and clearance of a container.

- The Information column asks whether all stakeholders are clear concerning the process of clearing the emergency relief container.
- The Communication column asks how well the information has been communicated to all the stakeholders
- The Speed column asks whether there are any delays
- The Clearance of container column asks the question concerning the ease of clearance.

This section includes:

- the port response
- the shipping company response
- the humanitarian organisation response

In addition, this section includes the stakeholder planning checklist. This is to assess what processes the various stakeholders have put in place.

### 7.8.1 Port response

Table 7.6 shows the response of the port representative to how the guideline helped the Port of Durban in handling relief materials vis-à-vis the parameters in the supply chain process.

**Table 7.6 Port Response**

<b>Variables</b>	<b>Information clarity</b>	<b>Communication channels</b>	<b>Speed of service delivery</b>	<b>Clearance of container</b>
Comments	The shipping company was updated every day on the status of the vessel.	The communication was seamless	36 hours	36 hours

Source: Author, October 2014

### 7.8.2 Port user's response (SDV-Bollere)

Table 7.7 shows the response of the SDV-Bollere representative to how the guideline helped the SDV-Bollere to how the guideline helped SDV-Bollere in handling relief materials vis-à-vis the parameters in the supply chain process.

**Table 7.7 Shipping Company Response**

<b>Variables</b>	<b>Information clarity</b>	<b>Effectiveness of communication channels</b>	<b>Speed of service delivery</b>	<b>Clearance of container</b>
Comments	The humanitarian organisation sent all the required documents	The effect of this is that the container was cleared on time	36hours	36 hours

Source: Author, October 2014

### 7.8.3 Humanitarian organisation

Table 7.8 shows the response of World Vision International representative to how the guideline helped the World Vision International in handling of relief materials vis-à-vis the parameters in the supply chain process.

**Table 7.8 Humanitarian organisation response**

<b>Variables</b>	<b>Information clarity</b>	<b>Effectiveness of communication channels</b>	<b>Speed of service delivery</b>	<b>Clearance of container</b>
Comments	World Vision International sent all the required documents	The guideline was effective in the sense that it prevented ambiguity	36 hours	36 hours

Source: Author, October 2014

### 7.8.4 Stakeholder's guideline checklist

This checklist is to help with the planning and preparation of the documentation and contingency aspect of the supply chain from origin to destination. This prevents delays from any of the stakeholders. It also helps the uninitiated to have a better understanding of the entire process and what is required. The result of the checklist is to enhance the supply chain process so that no aspect of the process is left incomplete, thereby causing unexpected delays. Table 7.9 was used to evaluate the entire process.

**Table 7.9 Stakeholder guideline checklist**

<b>Variable</b>	<b>Port</b>	<b>Maersk/SDV- Bollore</b>	<b>World Vision International</b>
Is there a strategic plan for handling emergency situations?	<b>Y/N</b>	<b>Y/N</b>	<b>Y/N</b>
Are there procedures in place for handling emergency situations?	<b>Y/N</b>	<b>Y/N</b>	<b>Y/N</b>
Is there a set of documentation that needs to be complied with?	<b>Y/N</b>	<b>Y/N</b>	<b>Y/N</b>
Is there a proper communication channel set in place?	<b>Y/N</b>	<b>Y/N</b>	<b>Y/N</b>
Are there proper standards that must be complied with?	<b>Y/N</b>	<b>Y/N</b>	<b>Y/N</b>
Have we tested our processes?	<b>Y/N</b>	<b>Y/N</b>	<b>Y/N</b>
Are we maintaining all resources?	<b>Y/N</b>	<b>Y/N</b>	<b>Y/N</b>
Will we need local involvement	<b>Y/N</b>	<b>Y/N</b>	<b>Y/N</b>
Do we have a back-up plan?	<b>Y/N</b>	<b>Y/N</b>	<b>Y/N</b>
Will we collaborate?	<b>Y/N</b>	<b>Y/N</b>	<b>Y/N</b>
Do we have a feedback process in place?	<b>Y/N</b>	<b>Y/N</b>	<b>Y/N</b>

Source: Author, October 2014

## 7.10 Conclusion

This guideline focused on the Port of Durban, specifically concerning the process of handling emergency relief containers. The success of the humanitarian supply chain depends on the availability of the correct information communicated at the correct time. This helped in reducing the dwell time of the Corn Soybeans shipment that was routed for Zimbabwe via Durban. This study has provided a framework and guideline that may be adopted by the various maritime stakeholders. The Chief Port Planning Officer for the Port of Durban said that there is a need to include this guideline in their berth planning process.

Based on the findings of the case study, it is indicated that if this set of guidelines is adopted, it will facilitate to streamline the supply chain of relief materials and will turn out to be beneficial to all stakeholders involved.



## CHAPTER EIGHT: CONCLUSIONS AND RECOMMENDATIONS

### 8.1 Conclusions

The ports, shipping lines and freight forwarding companies and humanitarian organisations face an increasingly challenging situation, owing to the increase in natural disasters and conflict situations (see section 3.2.2). The onus is on maritime stakeholders to work together to ensure that humanitarian shipments are not unduly delayed at the ports.

The purpose of developing a framework and guideline for the handling of relief materials in African ports is to assist in reducing the cargo dwell time at the ports. This framework and guideline, if adopted, will facilitate streamlining the supply chain of relief materials by reducing cargo dwell time in the ports, thereby saving costs for all the maritime stakeholders.

Furthermore, logistics activities (from purchasing to the last-mile delivery of items) account for a large share of the cost in any disaster relief operation. Any improvement in the way logistics provides humanitarian assistance has the potential to deliver a hugely positive impact on the people affected. The role of ports and how they can become more efficient in playing this important role during natural disasters and consequent humanitarian emergency relief aid logistics have not received the attention they deserve. Seaports are vital elements in the logistics and supply chain process of humanitarian emergency relief aid (Pan American Health Organisation and World Health Organisation, 2001). It is important that seaports are efficient.

The humanitarian supply chain cannot be viewed in isolation. It has to be viewed holistically, i.e. to incorporate all the stakeholders. It is important for the stakeholders to be aware of the challenges they face in order to pave the way for progress and productivity. The guideline developed in this thesis is intended to ensure that all the stakeholders perform their roles and responsibilities to reduce confusion and chaos in the supply chain of relief materials. There is an increasing awareness as to the link between preparedness, response and recovery in that the better the logistics preparedness, the better and quicker the response, and the better the response, the earlier the recovery to a normal state that can occur. Furthermore, links between disaster relief and longer term development in affected countries are being acknowledged to an increasing extent.

The review of literature was conducted on relevant research as it relates to the stakeholders. However, the literature reviews also confirmed what Oloruntoba and Gary (2002) aver when they say that “there is an extensive literature on business logistics in developed countries, but very little on logistics in developing countries and less again on humanitarian aid logistics in either aid logistics or development situations”. This further motivated the need to embark on the research.

In order to validate the information obtained through the review of literature, interviews were conducted with experts in the field. The study focused on the three important stakeholders in the supply chain of relief materials, namely container ports; shipping lines and freight forwarding companies and humanitarian organisations. The container ports were examined regionally in order to understand the regional problems that affect the supply chain of relief materials. The shipping lines and freight forwarding companies also identified eight problems (see section 5.13) they encounter when sending relief shipments. The humanitarian organisations mentioned twelve problems they encounter when sending relief shipments (see section 5.6).

## **8.2 Overview of contributions**

The guideline that was developed adds value for a number of reasons. Firstly, it was developed in order to eliminate the weakness that is already in the system. There is no guideline currently that the stakeholders can use to guide them in the supply chain of relief materials. The ports have no specific guideline, and as a result many ambiguities exist. The shipping companies interviewed also reiterated the fact that the ports in Sub-Saharan Africa have no guidelines for the handling of relief materials. With no guideline in place, there is a need to have a platform that can incorporate important factors in the supply chain of relief materials. The guideline was developed in order to incorporate the important issues that the stakeholders raised regarding the supply chain of relief materials; ultimately to reduce the cargo dwell time of the relief shipment at the ports.

The first issue addressed in the guideline was that of effective communication among the stakeholders. For example, the humanitarian organisations mentioned that they did not know much about the ports to which they were sending relief materials. As a result, it became difficult to know which port personnel they were to meet. The ports also claimed that documentation sent was not always complete, which caused delays in the clearing of the relief materials. Effective communication includes the documentation process and procedures.

The second issue is that of resource allocation. Resource allocation includes the berthing arrangement, cargo-handling equipment availability, stacking area, manpower and warehousing. When there is a dearth of resources in the port it limits the flow of the relief materials. If this information is passed on to the shipping company and the humanitarian organisations, it allows them to devise a plan to consider other options available to them. The guideline handles the issue of prior information available on resource allocation.

The third issue that the guideline addresses is the issue of information technology. The synergy of information systems enables the free flow of information between the stakeholders. Port community systems should prevent bottlenecks. The stakeholders are able to track and trace their shipment electronically.

Fourthly, relief materials are required urgently, as a result of which they need to be cleared within hours of arrival at the port. The port should be able to give the stakeholders an idea of how long it takes to clear the relief materials from the specific port. In the case of an emergency, time is of the essence. The breakdown of the process of clearing the relief materials adds effectiveness to the process. In the guideline, time is factored in.

Lastly, there are the security and safety issues. The guideline incorporates security issues and measures what the ports ought to take cognisance of. For example, the shipping company and the humanitarian organisation mentioned the issue of theft and damage to containers. Relief materials need to be protected from vandalism. The measures that the port puts in place to limit theft should be communicated to the stakeholders in order to assure them of the safety of their cargo.

The generic guideline was designed for use at any Sub-Saharan African port. It was developed to prepare maritime stakeholders for the clearing of emergency shipments. The guideline shows steps to be followed for the clearing of humanitarian shipments at any Sub-Saharan African port. All the required documents are also highlighted. The generic guideline also mentions important issues that maritime stakeholders should take into consideration. A generic import document flow is also included in the guideline in order to elucidate the process. In addition, the generic guideline mentions the various responsibilities for each of the maritime stakeholders. A relief container checklist was also designed for all the stakeholders.

The generic guideline was tested for use at the Port of Durban container terminal. This guideline is focused on maritime stakeholders that make use of the Port of Durban container terminal; but have no idea about the processes involved in the clearing of relief shipments at the Port of Durban. The guideline shows the various steps involved in the clearing of shipments, focusing on the documentation aspect as well as on the responsibilities of the various stakeholders.

Collaboration between the stakeholders is important to the overall efficiency of the guideline. Effective communication and information is critical for the effectiveness of the supply chain of relief materials.

### **8.3 Testing**

The humanitarian guideline was sent to World Vision International, liaising with their Zimbabwean representative. The container vessel MV Maersk Elgin carried 1 659 20-ft containers, of which 63 20-ft containers carried bags of corn and soy-based meal. The guideline was tested by the three stakeholders namely, the Port of Durban; the representative of the shipping company SDV-Bollere Bollere and the representative of World Vision in Zimbabwe. The Port of Durban served as the transshipment hub. The guideline was tested based on the following criteria:

- information clarity
- effectiveness of communication channels
- speed of service delivery
- clearance of the container

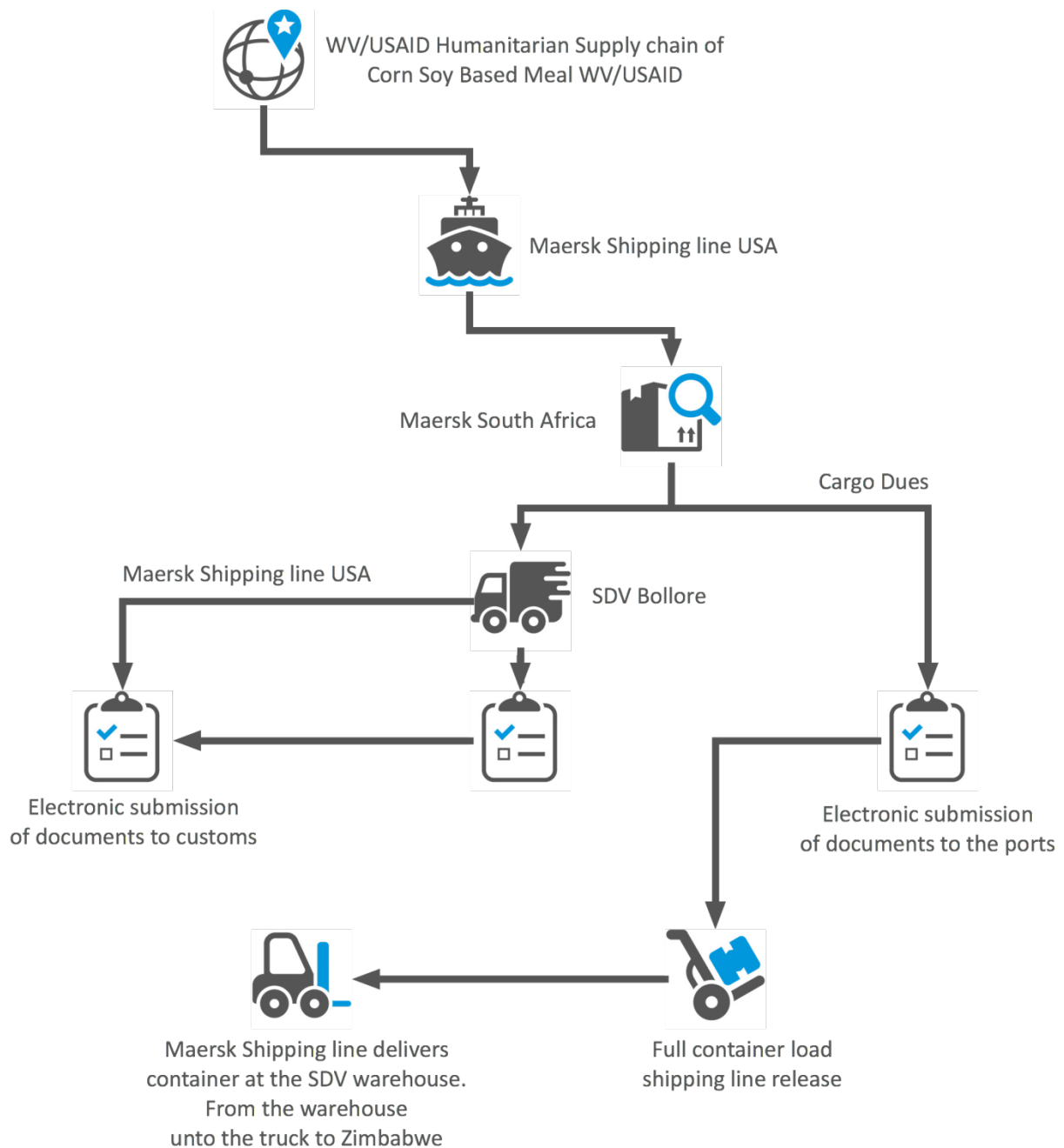
The stakeholder checklist was also tested to allow for efficiency in the whole process. Table 8.1 shows the response of the stakeholders to the parameters. Furthermore, Table 8.1 summarises all the parameters used in measuring the response of each stakeholder.

**Table 8.1 Testing of Guideline**

Maritime stakeholders			
Parameters	World Vision International	SDV-Bollore	Port of Durban
Information clarity	The correct documents were sent to the shipping line and agent	The shipping company received all necessary documents one week prior to the arrival of the vessel.	All documents required were received by the Port of Durban
Effectiveness of communication	WVI received information on the status of their vessel	This facilitated the pre-entry clearance of the vessel. This prevented demurrage.	This facilitated the pre-entry clearance of the vessel.
Speed	No delay	The Shipping line pays the cargo dues and issues the release	The Electronic submission is made to the ports
Clearance of container	The Zimbabwean authority grants permission for the shipment to enter their borders.	The full container load release enables the full clearance of the shipment	Ceteris Paribus the vessel cleared within three days of arrival. 18 hours per day.

(Source: Author, Fieldwork 2014)

Figure 8.1 shows the process from which the corn and soy-based meal is sent from the United States of America to Zimbabwe via the Port of Durban in South Africa. WVI Zimbabwe is the beneficiary of the CSB meal. The USAID contacts MAERSK USA, who in turn contacts MAERSK South Africa. The container is then loaded on the vessel and sent to Zimbabwe via the Port of Durban.



**Figure 8.1 WV/USAID Humanitarian Supply Chain of Corn Soy Based Meal**

Source: Author Field work, 2014

Prior to the arrival of the vessel, the following documents had to be sent to SDV-Bollore that had already been contacted to act as the clearing and forwarding agent. The timeliness of sending these documents is essential to facilitate the release of the vessel. The guideline was used to ensure the accuracy of the documents sent.

- original bill with release letter
- invoice

- certificate of origin
- KC156
- import permit
- plant certificate
- biosafety import permit
- donation certificate
- rebate letter
- allocation delivery addresses for this shipment.

These documents enabled customs and the shipping line to grant the release. All cargo dues were paid and then released. The shipment was bound for Zimbabwe. From the SDV-Bollere warehouse the representative of Intertek confirmed the following:

- condition of the product
- breaking of the seal
- tallying the bags of CSB meal
- checking for damages and pilferage

After this inspection, the representative of the Zimbabwean government authorised all the border movements of the cargo. This authorisation prevents any delay at the borders.

The guideline streamlined the process by establishing a flow of communication between all the stakeholders. The WVI-Zimbabwe connection was able to send accurate information timeously. This is to enable the shipment to be cleared within the three-day window period.

#### **8.4 Specific contribution of the guideline**

The following is the summary of the specific contributions that the guideline made to the maritime stakeholders:

- streamlining the process
- improving the supply chain
- reducing delay
- obtaining a better understanding of the process
- providing World Vision International with what the expectations are and who they will need to direct their communications to
- facilitating the clearance of the container before the arrival of the vessel.

In terms of costs:

Table 8.2 shows the costs incurred if containers are not cleared from day 4. If all the required documents are not sent the container will not be released on time. Costs will begin to be incurred, as shown on the 5<sup>th</sup> and 6<sup>th</sup> day. This means that after 3 days the humanitarian organisation will begin to pay demurrage.

## **8.5 Recommendations**

### **8.5.1 Timeline**

Relief materials need to be handled with speed. This is because of the emergency nature of the relief materials. The timeline shows the time the port specifies for handling the relief materials. This information should be made known to the shipping lines and freight forwarding companies as well as to the humanitarian organisation to ensure the efficiency and effectiveness of the operations. It also allows the stakeholders to know how to plan their time, people and resources. Timelines are also a function of the co-operation of all the stakeholders as they ensure that all the necessary information is given to the ports when required.

### **8.5.2 Training**

The research has identified the need for continuous training for port operations officials involved in the handling of the relief materials, in terms of the key line officials, in areas relating to the scope of practice. Training for port officials is essential. It helps to:

- determine competence
- improve and retain staff
- Task-shifting is avoided
- Proper training promotes efficiency.

Effective collaboration between the stakeholders is encouraged in order to enhance productivity.

### **8.5.3 Berth and yard planning**

At the Port of Durban, the need exists to include humanitarian relief shipments in the planning of the berths as well as in the yard planning. Currently, this is not included. The yard and berth planning will provide added value. This will enable shipping lines and freight forwarding companies and humanitarian organisations to realise the importance of their service delivery in the humanitarian work. It is expedient for humanitarian organisations and the shipping lines and freight forwarding companies to give the Port of Durban all the necessary information to work with.

#### **8.5.4 Prioritization**

It would be of great benefit to humanitarian logistics if ports in Sub-Saharan Africa give the shipments of relief materials top priority.



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